

07/30/14



## **Technical Report for**

**Stantec Consulting Services Inc.** 

Sunoco - Marcus Hook Facility, PA

213402353

**Accutest Job Number: JB54835** 

Sampling Dates: 12/05/13 - 12/09/13

## Report to:

**Stantec** 

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**ATTN: Lisa Votta** 

Total number of pages in report: 143



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

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Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), PA, RI, SC, TN, VA, WV, DoD ELAP (L-A-B L2248)

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## **Sample Summary**

Job No:

JB54835

**Stantec Consulting Services Inc.** 

Sunoco - Marcus Hook Facility, PA

**Project No: 213402353** 

Sample Number	Collected Date	Time By	Received	Matri Code		Client Sample ID
JB54835-1	12/05/13	14:15 JC	12/05/13	so	Soil	MH615-1C(0.0-2.0)
JB54835-2	12/05/13	14:20 JC	12/05/13	so	Soil	MH615-1C(2.0-4.0)
JB54835-3	12/05/13	14:30 JC	12/05/13	so	Soil	MH615-2C(0.0-2.0)
JB54835-4	12/05/13	14:35 JC	12/05/13	so	Soil	MH615-2C(2.0-4.0)
JB54835-5	12/05/13	14:40 JC	12/05/13	so	Soil	MH615-4C(0.0-2.0)
JB54835-6	12/05/13	14:50 JC	12/05/13	so	Soil	MH615-4C(2.0-4.0)
JB54835-7	12/05/13	14:55 JC	12/05/13	so	Soil	MH614-1C(0.0-2.0)
JB54835-8	12/05/13	15:00 JC	12/05/13	so	Soil	MH614-1C(2.0-4.0)
JB54991-1	12/05/13	10:00 JC	12/06/13	so	Soil	MH614-2C(0.0-2.0)
JB54991-2	12/05/13	10:05 JC	12/06/13	so	Soil	MH614-2C(2.0-4.0)
JB54991-3	12/05/13	10:10 JC	12/06/13	so	Soil	MH613-2C(0.0-2.0)
JB54991-4	12/05/13	10:15 JC	12/06/13	so	Soil	MH613-2C(2.0-4.0)
JB54991-5	12/05/13	10:20 JC	12/06/13	so	Soil	MH613-3C(0.0-2.0)

Soil samples reported on a dry weight basis unless otherwise indicated on result page.





## Sample Summary (continued)

Job No:

JB54835

**Stantec Consulting Services Inc.** 

Sunoco - Marcus Hook Facility, PA Project No: 213402353

Sample Number	Collected Date	Time By	Received	Matr		Client Sample ID
Number	Date	тине ву	Keceiveu	Coue	Туре	Sample 1D
JB54991-6	12/05/13	10:25 JC	12/06/13	SO	Soil	MH613-3C(2.0-4.0)
JB55122-1	12/09/13	13:05 JR	12/09/13	so	Soil	MH613-4C(1.0)
JB55122-2	12/09/13	13:07 JR	12/09/13	SO	Soil	MH613-4C(3.5)
0200122	14/00/10	10101 010	12/00/10	20	201	1111010 10(010)
JB55122-3	12/09/13	13:15 JR	12/09/13	SO	Soil	MH613-5C(1.5)
JD33122 3	12/03/13	10.10 310	12/00/10	50	Son	MII013 3C(1.3)
JB55122-4	19/00/19	13:17 JR	12/09/13	60	Soil	MII(2) 5 C (2 (1)
JD33122-4	12/09/13	15:17 JK	12/09/13	30	2011	MH613-5C(3.0)
TD *** 100 *	10/00/10	40.00 TD	10/00/10		G 41	NY 24 2 4 G (4 2)
JB55122-5	12/09/13	13:30 JR	12/09/13	SO	Soil	MH613-1C(1.0)
JB55122-6	12/09/13	13:35 JR	12/09/13	so	Soil	MH613-1C(3.5)
JB55122-7	12/09/13	13:40 JR	12/09/13	SO	Soil	MH614-3C(1.5)
JB55122-8	12/09/13	13:45 JR	12/09/13	SO	Soil	MH614-3C(3.4)
JB55122-9	12/09/13	13:55 JR	12/09/13	SO	Soil	MH615-3C(1.0)
JB55122-10	12/09/13	14:00 JR	12/09/13	SO	Soil	MH615-3C(3.5)

Soil samples reported on a dry weight basis unless otherwise indicated on result page.





#### CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Stantec Consulting Services Inc. Job No JB54835

Site: Sunoco - Marcus Hook Facility, PA Report Date 1/10/2014 12:02:16 P

Between 12/05/2013 and 12/09/2013, 24 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 3.6 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB54835 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix: SO Batch ID: VA7565

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB54943-15DUP, JB54943-14MS were used as the QC samples indicated.
- JB54943-15DUP for Dibromofluoromethane: Outside control limits due to matrix interference.
- JB54943-14MS for Dibromofluoromethane: Outside control limits due to matrix interference.

Matrix: SO Batch ID: VD8828

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB54823-11MS, JB54823-11MSD were used as the QC samples indicated.
- JB54991-6 for Toluene-D8: Outside control limits due to matrix interference.
- JB54991-3 for Toluene-D8: Outside control limits due to matrix interference.
- JB54991-4 for Toluene-D8: outside control limits due to matrix interference.
- JB54991-6 for 1,2-Dichloroethane-D4: Outside control limits due to matrix interference.
- JB54991-5 for Toluene-D8: Outside control limits due to matrix interference.

Matrix: SO Batch ID: VD8829

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55005-1MS, JB55005-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB54991-4: Confirmation run for surrogate recoveries.

Matrix: SO Batch ID: VE9241

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55009-18MS, JB55009-18MSD were used as the QC samples indicated.
- Matrix Spike Duplicate Recovery(s) for 1,2,4-Trimethylbenzene, Ethylbenzene are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for MSD for Benzene, Methyl Tert Butyl Ether are outside control limits for sample JB55009-18MSD. Outside control limits due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for Xylene (total) are outside control limits. Outside control limits due to high level in sample relative to spike amount.

#### Volatiles by GCMS By Method SW846 8260B

Matrix: SO Batch ID: VE9244

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB54823-10MS, JB54823-10MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB54835-4: Diluted due to high concentration of target compound.

Matrix: SO Batch ID: VE924

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55122-3MS, JB55122-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike Recovery(s) for Ethylbenzene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Matrix Spike Duplicate Recovery(s) for Ethylbenzene, Toluene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Matrix Spike Recovery(s) for Xylene (total) are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for MSD for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Ethylbenzene, Isopropylbenzene, Methyl Tert Butyl Ether, Toluene are outside control limits for sample JB55122-3MSD. Outside control limits due to high level in sample relative to spike amount.
- JB55122-3MSD for Benzene: Outside in house control limits.
- JB55122-6 for Toluene-D8: Outside control limits due to matrix interference. Confirmed by reanalysis.
- JB55122-3MSD for Xylene (total): Outside in house control limits.
- JB55122-3MSD for tert-Butylbenzene: Outside in house control limits.
- JB55122-3MSD for sec-Butylbenzene: Outside in house control limits.
- JB55122-3MSD for 1,2-Dichloroethane: Outside in house control limits.

Matrix: SO Batch ID: VE9247

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55185-11AMS, JB55185-11AMSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB55122-6: Confirmation run for surrogate recoveries.

Matrix: SO Batch ID: VE9249

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55345-26AMS, JB55345-26AMSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: SO Batch ID: VE9251

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55632-2MS, JB55632-2MSD were used as the QC samples indicated.

Matrix: SO Batch ID: VV6025

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB54823-1MS, JB54823-2DUP were used as the QC samples indicated.
- RPD(s) for Duplicate for Benzene, Toluene are outside control limits for sample JB54823-2DUP. High RPD due to low concentration of hit

Matrix: SO Batch ID: VY6133

### Volatiles by GCMS By Method SW846 8260B

Matrix: SO Batch ID: VY6133

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55301-3MS, JB55301-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: SO Batch ID: VY6135

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55122-1DUP, JB55122-2MS were used as the QC samples indicated.

Matrix: SO Batch ID: VY6136

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55458-1DUP, JB55458-3MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Extractables by GCMS By Method SW846 8270D

Matrix: SO Batch ID: M:OP36159

- The data for SW846 8270D meets quality control requirements.
- JB54991-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-1: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix: SO Batch ID: M:OP36179

- The data for SW846 8270D meets quality control requirements.
- JB55122-7: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-8: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-9: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-10: Analysis performed at Accutest Laboratories, Marlborough, MA.

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix: SO

Sample(s) JB54835-1MS, JB54835-1MSD were used as the QC samples indicated.

Matrix: SO Batch ID: OP71436

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB54943-9MS, JB54943-9MSD were used as the QC samples indicated.

Matrix: SO Batch ID: OP71437

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55242-4AMS, JB55242-4AMSD were used as the QC samples indicated.
- Matrix Spike Duplicate Recovery(s) for 2-Methylnaphthalene, Naphthalene are outside control limits. Outside control limits due to matrix interference.

Batch ID: OP71216

OP71437-MSD for Nitrobenzene-d5: Outside control limits due to matrix interference.

### Volatiles by GC By Method SW846 8011

Matrix: SO Batch ID: M:OP36152

- The data for SW846 8011 meets quality control requirements.
- JB54835-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-8: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-7: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-6: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-5: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-6: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-5: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54991-1: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix: SO Batch ID: M:OP36167

- The data for SW846 8011 meets quality control requirements.
- JB55122-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-10: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-9: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-5: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-6: Analysis performed at Accutest Laboratories, Marlborough, MA.
   JB55122-7: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB55122-8: Analysis performed at Accutest Laboratories, Marlborough, MA.

#### Metals By Method SW846 6010C

Matrix: SO Batch ID: M:MP22232

- The data for SW846 6010C meets quality control requirements.
- JB54835-1 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix: SO Batch ID: M:MP22237

- The data for SW846 6010C meets quality control requirements.
- JB54835-3 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-8 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-7 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-6 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-4 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-2 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-5 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix: SO Batch ID: MP76642

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55529-1MS, JB55529-1MSD, JB55529-1SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Lead are outside control limits for sample MP76642-SD1. Serial dilution indicates possible matrix interference.
- MP76642-MB1 for Zinc: All reported results <RL or >10x MB value.

Matrix: SO Batch ID: MP76729

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB55734-12AMS, JB55734-12AMSD, JB55734-12ASDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Lead, Vanadium, Zinc are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike Duplicate Recovery(s) for Cobalt, Vanadium, Lead, Nickel are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- RPD(s) for MSD for Vanadium, Zinc, Lead, Nickel are outside control limits for sample MP76729-S2. High rpd due to possible sample nonhomogeneity.
- MP76729-S1 for Vanadium: Spike recovery indicates possible matrix interference.
- MP76729-S1 for Zinc: Spike recovery indicates possible matrix interference.

#### Wet Chemistry By Method ASTM 4643-00

Matrix: SO Batch ID: GN96677

The data for ASTM 4643-00 meets quality control requirements.



### Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO Batch ID: M:GN45452

- The data for SM21 2540 B MOD. meets quality control requirements.
- JB54835-1 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-2 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-4 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-5 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-6 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-7 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-8 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB54835-3 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.

#### Wet Chemistry By Method SM2540 G-97

The data for SM2540 G-97 meets quality control requirements.

Matrix: SO Batch ID: GN96642

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover

The data for SM2540 G-97 meets quality control requirements.



#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest New Jersey Job No JB54835

Site: SECORPAE: Sunoco - Marcus Hook Facility, PA Report Date 1/13/2014 3:11:57 PM

24 Sample(s) were collected on between 12/05/2013 and 12/09/2013 and were received at Accutest between 12/05/2013 and 12/09/2013 properly preserved, at 3.8 Deg. C and intact. These Samples received an Accutest job number of JB54835. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Extractables by GCMS By Method SW846 8270D

Matrix SO Batch ID: OP36159

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC27058-3MS, MC27058-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO Batch ID: OP36179

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC27058-7MS, MC27058-7MSD were used as the QC samples indicated.

#### Volatiles by GC By Method SW846 8011

Matrix SO Batch ID: OP36152

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) JB54835-1MS, JB54835-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO Batch ID: OP36167

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) JB55122-1MS, JB55122-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

#### Metals By Method SW846 6010C

Matrix SO

Batch ID: MP22232

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC26910-5MS, MC26910-5MSD, MC26910-5SDL were used as the QC samples for metals.

Matrix SO

Batch ID: MP22237

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC26949-3MSD, MC26949-3MS, MC26949-3SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Lead are outside control limits for sample MP22237-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

#### Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO

Batch ID: GN45452

Sample(s) MC27018-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(JB54835).

Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

Lab Sample ID Client Sample ID Analyte	Result/ Qual	RL	MDL	Units	Method
JB54835-1 MH615-1C(0.0-2.	0)				
Benzene	11.7	0.97	0.12	ug/kg	SW846 8260B
Toluene	54.2	0.97	0.14	ug/kg	SW846 8260B
Ethylbenzene	2.9	0.97	0.17	ug/kg	SW846 8260B
Xylene (total)	25.1	0.97	0.17	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.28 J	4.8	0.15	ug/kg	SW846 8260B
Pyrene	16.6 J	37	14	ug/kg	SW846 8270D
Lead a	19.1	0.92	0.15	mg/kg	SW846 6010C
JB54835-2 MH615-1C(2.0-4.	0)				
Benzene	0.29 J	0.87	0.11	ug/kg	SW846 8260B
Toluene	6.8	0.87	0.12	ug/kg	SW846 8260B
Ethylbenzene	0.37 J	0.87	0.15	ug/kg	SW846 8260B
Xylene (total)	2.8	0.87	0.15	ug/kg	SW846 8260B
Pyrene	24.4 J	38	15	ug/kg	SW846 8270D
Lead a	21.3	0.94	0.16	mg/kg	SW846 6010C
JB54835-3 MH615-2C(0.0-2.	0)				
Benzene	61700	550	69	ug/kg	SW846 8260B
Toluene	75100	550	77	ug/kg	SW846 8260B
Ethylbenzene	8540	550	95	ug/kg	SW846 8260B
Xylene (total)	59200	550	97	ug/kg	SW846 8260B
Isopropylbenzene	817 J	2700	80	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	18500	2700	87	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	5920	2700	120	ug/kg	SW846 8260B
Benzo(a)pyrene	20.9 J	36	11	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	26.6 J	36	14	ug/kg	SW846 8270D
Naphthalene	132	36	9.9	ug/kg	SW846 8270D
Phenanthrene	26.4 J	36	17	ug/kg	SW846 8270D
Pyrene	30.4 J	36	14	ug/kg	SW846 8270D
Lead <sup>a</sup>	14.2	0.92	0.15	mg/kg	SW846 6010C
JB54835-4 MH615-2C(2.0-4.	0)				
Benzene b	10300	120	15	ug/kg	SW846 8260B
Toluene <sup>b</sup>	3800	120	17	ug/kg	SW846 8260B
Ethylbenzene <sup>b</sup>	208	120	21	ug/kg	SW846 8260B
Xylene (total) b	1510	120	22	ug/kg	SW846 8260B
Isopropylbenzene <sup>b</sup>	45.8 J	610	18	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene b	449 J	610	19	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene <sup>b</sup>	162 J	610	27	ug/kg	SW846 8260B
Phenanthrene	19.2 J	39	18	ug/kg	SW846 8270D



**Stantec Consulting Services Inc.** Account: Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 **Project:** 

Lab Sample ID Client Sample ID Analyte	Result/ Qual	RL	MDL	Units	Method
Analyte	Quai	KL	MIDL	Cints	Method
Lead <sup>a</sup>	7.2	0.95	0.16	mg/kg	SW846 6010C
JB54835-5 MH615-4C(0.0-2.	0)				
Benzene	11.9	0.85	0.11	ug/kg	SW846 8260B
Toluene	17.2	0.85	0.12	ug/kg	SW846 8260B
Ethylbenzene	2.0	0.85	0.15	ug/kg	SW846 8260B
Xylene (total)	13.3	0.85	0.15	ug/kg	SW846 8260B
Isopropylbenzene	0.21 J	4.2	0.12	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	3.2 J	4.2	0.14	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	1.1 J	4.2	0.19	ug/kg	SW846 8260B
Pyrene	17.4 J	34	13	ug/kg	SW846 8270D
Lead <sup>a</sup>	27.7	0.93	0.16	mg/kg	SW846 6010C
JB54835-6 MH615-4C(2.0-4.	0)				
Benzene	42.2	0.89	0.11	ug/kg	SW846 8260B
Toluene	98.4	0.89	0.13	ug/kg	SW846 8260B
Ethylbenzene	6.4	0.89	0.16	ug/kg	SW846 8260B
Xylene (total)	50.8	0.89	0.16	ug/kg	SW846 8260B
Isopropylbenzene	0.25 J	4.4	0.13	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	3.7 J	4.4	0.14	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	1.3 J	4.4	0.20	ug/kg	SW846 8260B
Benzo(a)anthracene	18.5 J	37	12	ug/kg	SW846 8270D
Benzo(a)pyrene	18.3 J	37	11	ug/kg	SW846 8270D
Benzo(b)fluoranthene	20.4 J	37	12	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	19.9 J	37	14	ug/kg	SW846 8270D
Chrysene	16.2 J	37	13	ug/kg	SW846 8270D
Phenanthrene	18.3 J	37	17	ug/kg	SW846 8270D
Pyrene	68.8	37	14	ug/kg	SW846 8270D
Lead a	25.8	0.95	0.16	mg/kg	SW846 6010C
JB54835-7 MH614-1C(0.0-2.	0)				
Benzene	833	120	15	ug/kg	SW846 8260B
Toluene	247000	2400	350	ug/kg	SW846 8260B
Ethylbenzene	14800	120	21	ug/kg	SW846 8260B
Xylene (total)	126000	2400	430	ug/kg	SW846 8260B
Isopropylbenzene	215 J	610	18	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	203 J	610	19	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	126 J	610	27	ug/kg	SW846 8260B
Lead a	4.2	0.98	0.17	mg/kg	SW846 6010C



Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

Lab Sample ID Client Sample ID Analyte	Result/ Qual	RL	MDL	Units	Method
JB54835-8 MH614-1C(2.0-4.	0)				
Benzene	170	110	14	ug/kg	SW846 8260B
Toluene	35000	1100	160	ug/kg	SW846 8260B
Ethylbenzene	3630	110	19	ug/kg	SW846 8260B
Xylene (total)	30700	110	20	ug/kg	SW846 8260B
Isopropylbenzene	82.9 J	560	16	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	164 J	560	18	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	80.9 J	560	25	ug/kg	SW846 8260B
Lead a	6.4	0.95	0.16	mg/kg	SW846 6010C
JB54991-1 MH614-2C(0.0-2.	0)				
Toluene	0.24 J	1.0	0.14	ug/kg	SW846 8260B
Xylene (total)	0.34 J	1.0	0.18	ug/kg	SW846 8260B
Lead	13.5	2.5	0.26	mg/kg	SW846 6010C
JB54991-2 MH614-2C(2.0-4.	0)				
Benzene	0.88 J	1.0	0.13	ug/kg	SW846 8260B
Toluene	0.44 J	1.0	0.14	ug/kg	SW846 8260B
Xylene (total)	0.27 J	1.0	0.18	ug/kg	SW846 8260B
Lead	8.4	2.4	0.25	mg/kg	SW846 6010C
JB54991-3 MH613-2C(0.0-2.	0)				
Ethylbenzene	132	110	19	ug/kg	SW846 8260B
Xylene (total)	1260	110	19	ug/kg	SW846 8260B
sec-Butylbenzene	156 J	540	19	ug/kg	SW846 8260B
tert-Butylbenzene	30.5 J	540	18	ug/kg	SW846 8260B
Cyclohexane	61100	5400	280	ug/kg	SW846 8260B
Isopropylbenzene	98.9 J	540	16	ug/kg	SW846 8260B
Naphthalene	330 J	540	20	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	4790	540	17	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	1710	540	24	ug/kg	SW846 8260B
Cobalt	13.4	6.4	0.084	mg/kg	SW846 6010C
Lead	8.9	2.6	0.27	mg/kg	SW846 6010C
Nickel	17.9	5.1	0.10	mg/kg	SW846 6010C
Vanadium	24.6	6.4	0.093	mg/kg	SW846 6010C
Zinc	49.8	2.6	0.30	mg/kg	SW846 6010C
JB54991-4 MH613-2C(2.0-4.	0)				
Ethylbenzene	40.8 J	120	21	ug/kg	SW846 8260B
sec-Butylbenzene	123 J	590	21	ug/kg	SW846 8260B



Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

tert-Butylbenzene	Lab Sample ID Client Sample ID	Result/				
Cyclohexane			RL	MDL	Units	Method
Cyclohexane	tert-Butylbenzene	40.9 J	590	19	ug/kg	SW846 8260B
	•					
1,2,4-Trimethylbenzene						
1.3.5-Trimethylbenzene						
bis(2-Ethylhexyl)phthalate 2-Methylnaphthalene 58.4 J 78 22 ug/kg SW846 8270D 2-Methylnaphthalene 58.4 J 78 22 ug/kg SW846 8270D Pyrene 22.8 J 39 15 ug/kg SW846 8270D Cobalt 11.0 6.0 0.080 mg/kg SW846 6010C Lead 7.1 2.4 0.26 mg/kg SW846 6010C Nickel 12.6 4.8 0.095 mg/kg SW846 6010C Vanadium 28.0 6.0 0.088 mg/kg SW846 6010C Zinc 36.5 2.4 0.28 mg/kg SW846 6010C  JB54991-5 MH613-3C(0.0-2.0)  Benzene 3210 100 13 ug/kg SW846 6010C  Ethylbenzene 9120 100 15 ug/kg SW846 8260B Ethylbenzene 9120 100 18 ug/kg SW846 8260B Sylene (total) 67000 2100 370 ug/kg SW846 8260B Sylene (total) 67000 2100 370 ug/kg SW846 8260B Cyclohexane 215000 10000 530 ug/kg SW846 8260B Soc-Butylbenzene 2310 520 19 ug/kg SW846 8260B Lopropylbenzene 2520 520 15 ug/kg SW846 8260B Lopropylbenzene 2520 520 15 ug/kg SW846 8260B Lopropylbenzene 2520 520 15 ug/kg SW846 8260B Lopropylbenzene 16800 520 19 ug/kg SW846 8260B 1,2,4-Trimethylbenzene 16800 520 23 ug/kg SW846 8260B 1,3,5-Trimethylbenzene 16800 520 23 ug/kg SW846 8260B 1,3,5-Trimethylbenzene 16800 520 23 ug/kg SW846 8260B 1,3,5-Trimethylbenzene 1880 72 4.1 ug/kg SW846 8200B 1,3-S-Trimethylbenzene 1830 72 20 ug/kg SW846 8270D Dis(2-Ethylhexyl)phthalate 51.4 J 72 32 ug/kg SW846 8270D Pyrene 18.3 J 36 14 ug/kg SW846 8270D Pyrene 18.3 J 36 14 ug/kg SW846 8270D Pyrene 18.3 J 36 14 ug/kg SW846 8270D Cobalt 10.1 5.9 0.078 mg/kg SW846 8270D Cobalt 10.1 5.9 0.078 mg/kg SW846 8270D Cobalt 10.1 5.9 0.087 mg/kg SW846 8270D Cobalt 10.1 5.9 0.087 mg/kg SW846 8270D Cobalt 10.1 5.9 0.087 mg/kg SW846 8200B Cobalt 10.1 4 ug/kg SW846 8200B Cobalt 10.1 4 ug/kg SW846 8200B Cobalt 10.1						
2-Methylnaphthalene   58.4 J   78   22   ug/kg   SW846 8270D   Pyrene   22.8 J   39   15   ug/kg   SW846 8270D   Cobalt   11.0   6.0   0.080   mg/kg   SW846 6010C   Lead   7.1   2.4   0.26   mg/kg   SW846 6010C   Nickel   12.6   4.8   0.095   mg/kg   SW846 6010C   Nickel   12.6   4.8   0.095   mg/kg   SW846 6010C   Nickel   12.6   4.8   0.095   mg/kg   SW846 6010C   Discription   36.5   2.4   0.28   mg/kg   SW846 6010C    JB54991-5   MH613-3C(0.0-2.0)  Benzene   3210   100   13   ug/kg   SW846 8260B   Toluene   101   100   15   ug/kg   SW846 8260B   Ethylbenzene   9120   100   18   ug/kg   SW846 8260B   Sec-Butylbenzene   2310   520   19   ug/kg   SW846 8260B   Sec-Butylbenzene   2310   520   19   ug/kg   SW846 8260B   Sec-Butylbenzene   215000   10000   530   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   19   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   520   15   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   32   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   23   ug/kg   SW846 8260B   Sec-Butylbenzene   2520   252						
Pyrene						
Cobalt         11.0         6.0         0.080         mg/kg         SW846 6010C           Lead         7.1         2.4         0.26         mg/kg         SW846 6010C           Nickel         12.6         4.8         0.095         mg/kg         SW846 6010C           Vanadium         28.0         6.0         0.088         mg/kg         SW846 6010C           JB54991-5         MH613-3C(0.0-2.0)         SW846 8260B         mg/kg         SW846 8260B           Benzene         3210         100         13         ug/kg         SW846 8260B           Toluene         101         100         15         ug/kg         SW846 8260B           Ethylbenzene         9120         100         18         ug/kg         SW846 8260B           Xylene (total)         67000         2100         370         ug/kg         SW846 8260B           Sce-Butylbenzene         2310         520         19         ug/kg         SW846 8260B           Cyclohexane         215000         10000         530         ug/kg         SW846 8260B           Leoproyplbenzene         2520         520         19         ug/kg         SW846 8260B           Looproyplbenzene         2520         520						
Lead						
Nickel   12.6						
Vanadium   Z8.0   6.0   0.088   mg/kg   SW846 6010C						
Zinc   36.5   2.4   0.28   mg/kg   SW846 6010C						
Benzene   3210   100   13   13   13   13   14   15   15   15   15   15   15   15						
Benzene   3210   100   13   13   13   13   14   15   15   15   15   15   15   15		0010	~~~	0120	8'8	2
Toluene	JB54991-5 MH613-3C(0.0-2	.0)				
Ethylbenzene	Benzene	3210	100	13	ug/kg	SW846 8260B
Ethylbenzene         9120         100         18         ug/kg         SW846 8260B           Xylene (total)         67000         2100         370         ug/kg         SW846 8260B           Sec-Butylbenzene         2310         520         19         ug/kg         SW846 8260B           Cyclohexane         215000         10000         530         ug/kg         SW846 8260B           Hexane         69800         10000         1100         ug/kg         SW846 8260B           Isopropylbenzene         2520         520         15         ug/kg         SW846 8260B           Naphthalene         4950         520         19         ug/kg         SW846 8260B           1,2,4-Trimethylbenzene         16800         520         23         ug/kg         SW846 8260B           1,1'-Biphenyl         196         72         4.1         ug/kg         SW846 8270D           bis(2-Ethylhexyl)phthalate         51.4 J         72         32         ug/kg         SW846 8270D           2-Methylnaphthalene         3180         72         20         ug/kg         SW846 8270D           Pyrene         18.3 J         36         14         ug/kg         SW846 6010C           Lead	Toluene	101	100	15		SW846 8260B
Xylene (total)   67000   2100   370   ug/kg   SW846 8260B   sec-Butylbenzene   2310   520   19   ug/kg   SW846 8260B   Cyclohexane   215000   10000   530   ug/kg   SW846 8260B   Hexane   69800   10000   1100   ug/kg   SW846 8260B   Isopropylbenzene   2520   520   15   ug/kg   SW846 8260B   Naphthalene   4950   520   19   ug/kg   SW846 8260B   1,2,4-Trimethylbenzene   37400   10000   330   ug/kg   SW846 8260B   1,3,5-Trimethylbenzene   16800   520   23   ug/kg   SW846 8260B   1,1'-Biphenyl   196   72   4.1   ug/kg   SW846 8270D   bis(2-Ethylhexyl)phthalate   51.4 J   72   32   ug/kg   SW846 8270D   2-Methylnaphthalene   3180   72   20   ug/kg   SW846 8270D   2-Methylnaphthalene   18.3 J   36   14   ug/kg   SW846 8270D   2-Methylnaphthalene   18.3 J   36   36   36   36   36   36   36	Ethylbenzene	9120	100	18		SW846 8260B
sec-Butylbenzene         2310         520         19         ug/kg         SW846 8260B           Cyclohexane         215000         10000         530         ug/kg         SW846 8260B           Hexane         69800         10000         1100         ug/kg         SW846 8260B           Isopropylbenzene         2520         520         15         ug/kg         SW846 8260B           Naphthalene         4950         520         19         ug/kg         SW846 8260B           1,2,4-Trimethylbenzene         37400         10000         330         ug/kg         SW846 8260B           1,3,5-Trimethylbenzene         16800         520         23         ug/kg         SW846 8260B           1,1'-Biphenyl         196         72         4.1         ug/kg         SW846 8270D           bis(2-Ethylhexyl)phthalate         51.4 J         72         32         ug/kg         SW846 8270D           2-Methylnaphthalene         3180         72         20         ug/kg         SW846 8270D           Pyrene         18.3 J         36         14         ug/kg         SW846 8270D           Cobalt         10.1         5.9         0.078         mg/kg         SW846 6010C           Nickel<		67000	2100	370		SW846 8260B
Cyclohexane         215000         10000         530         ug/kg         SW846 8260B           Hexane         69800         10000         1100         ug/kg         SW846 8260B           Isopropylbenzene         2520         520         15         ug/kg         SW846 8260B           Naphthalene         4950         520         19         ug/kg         SW846 8260B           1,2,4-Trimethylbenzene         16800         520         23         ug/kg         SW846 8260B           1,3,5-Trimethylbenzene         16800         520         23         ug/kg         SW846 8260B           1,1'-Biphenyl         196         72         4.1         ug/kg         SW846 8270D           bis(2-Ethylhexyl)phthalate         51.4 J         72         32         ug/kg         SW846 8270D           2-Methylnaphthalene         3180         72         20         ug/kg         SW846 8270D           Pyrene         18.3 J         36         14         ug/kg         SW846 6010C           Cobalt         10.1         5.9         0.078         mg/kg         SW846 6010C           Nickel         18.2         4.7         0.094         mg/kg         SW846 6010C           Vanadium		2310	520	19		SW846 8260B
Hexane		215000	10000	530		SW846 8260B
Isopropylbenzene	v	69800	10000	1100		SW846 8260B
Naphthalene         4950         520         19         ug/kg         SW846         8260B           1,2,4-Trimethylbenzene         37400         10000         330         ug/kg         SW846         8260B           1,3,5-Trimethylbenzene         16800         520         23         ug/kg         SW846         8260B           1,1'-Biphenyl         196         72         4.1         ug/kg         SW846         8270D           bis(2-Ethylhexyl)phthalate         51.4 J         72         32         ug/kg         SW846         8270D           2-Methylnaphthalene         3180         72         20         ug/kg         SW846         8270D           Pyrene         18.3 J         36         14         ug/kg         SW846         8270D           Cobalt         10.1         5.9         0.078         mg/kg         SW846         6010C           Lead         20.7         2.4         0.25         mg/kg         SW846         6010C           Nickel         18.2         4.7         0.094         mg/kg         SW846         6010C           Vanadium         30.4         5.9         0.087         mg/kg         SW846         6010C           JB549	Isopropylbenzene	2520	520	15		SW846 8260B
1,2,4-Trimethylbenzene       37400       10000       330       ug/kg       SW846 8260B         1,3,5-Trimethylbenzene       16800       520       23       ug/kg       SW846 8260B         1,1'-Biphenyl       196       72       4.1       ug/kg       SW846 8270D         bis(2-Ethylhexyl)phthalate       51.4 J       72       32       ug/kg       SW846 8270D         2-Methylnaphthalene       3180       72       20       ug/kg       SW846 8270D         Pyrene       18.3 J       36       14       ug/kg       SW846 8270D         Cobalt       10.1       5.9       0.078       mg/kg       SW846 6010C         Lead       20.7       2.4       0.25       mg/kg       SW846 6010C         Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6       MH613-3C(2.0-4.0)         Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100 <t< td=""><td></td><td>4950</td><td>520</td><td>19</td><td></td><td>SW846 8260B</td></t<>		4950	520	19		SW846 8260B
1,3,5-Trimethylbenzene       16800       520       23       ug/kg       SW846 8260B         1,1'-Biphenyl       196       72       4.1       ug/kg       SW846 8270D         bis(2-Ethylhexyl)phthalate       51.4 J       72       32       ug/kg       SW846 8270D         2-Methylnaphthalene       3180       72       20       ug/kg       SW846 8270D         Pyrene       18.3 J       36       14       ug/kg       SW846 8270D         Cobalt       10.1       5.9       0.078       mg/kg       SW846 6010C         Lead       20.7       2.4       0.25       mg/kg       SW846 6010C         Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6       MH613-3C(2.0-4.0)       30       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xyle		37400	10000	330		SW846 8260B
1,1'-Biphenyl       196       72       4.1       ug/kg       SW846 8270D         bis(2-Ethylhexyl)phthalate       51.4 J       72       32       ug/kg       SW846 8270D         2-Methylnaphthalene       3180       72       20       ug/kg       SW846 8270D         Pyrene       18.3 J       36       14       ug/kg       SW846 8270D         Cobalt       10.1       5.9       0.078       mg/kg       SW846 6010C         Lead       20.7       2.4       0.25       mg/kg       SW846 6010C         Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6         MH613-3C(2.0-4.0)            Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500 <t< td=""><td></td><td>16800</td><td>520</td><td>23</td><td></td><td>SW846 8260B</td></t<>		16800	520	23		SW846 8260B
bis(2-Ethylhexyl)phthalate 51.4 J 72 32 ug/kg SW846 8270D 2-Methylnaphthalene 3180 72 20 ug/kg SW846 8270D Pyrene 18.3 J 36 14 ug/kg SW846 8270D Cobalt 10.1 5.9 0.078 mg/kg SW846 6010C Lead 20.7 2.4 0.25 mg/kg SW846 6010C Nickel 18.2 4.7 0.094 mg/kg SW846 6010C Vanadium 30.4 5.9 0.087 mg/kg SW846 6010C Zinc 183 2.4 0.28 mg/kg SW846 6010C JB54991-6 MH613-3C(2.0-4.0)  Benzene 9130 100 13 ug/kg SW846 8260B Toluene 97.5 J 100 14 ug/kg SW846 8260B Ethylbenzene 26900 2500 440 ug/kg SW846 8260B Xylene (total) 86400 2500 440 ug/kg SW846 8260B Methyl Tert Butyl Ether 43.0 J 100 34 ug/kg SW846 8260B		196	72			SW846 8270D
2-Methylnaphthalene       3180       72       20       ug/kg       SW846 8270D         Pyrene       18.3 J       36       14       ug/kg       SW846 8270D         Cobalt       10.1       5.9       0.078       mg/kg       SW846 6010C         Lead       20.7       2.4       0.25       mg/kg       SW846 6010C         Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6         MH613-3C(2.0-4.0)     Benzene  9130  100  13  ug/kg  SW846 8260B  Toluene  97.5 J  100  14  ug/kg  SW846 8260B  Ethylbenzene  26900  2500  440  ug/kg  SW846 8260B  Xylene (total)  86400  2500  440  ug/kg  SW846 8260B  Methyl Tert Butyl Ether  43.0 J  100  34  ug/kg  SW846 8260B  SW846 8260B		51.4 J	72	32		SW846 8270D
Pyrene         18.3 J         36         14         ug/kg         SW846 8270D           Cobalt         10.1         5.9         0.078         mg/kg         SW846 6010C           Lead         20.7         2.4         0.25         mg/kg         SW846 6010C           Nickel         18.2         4.7         0.094         mg/kg         SW846 6010C           Vanadium         30.4         5.9         0.087         mg/kg         SW846 6010C           Zinc         183         2.4         0.28         mg/kg         SW846 6010C           JB54991-6         MH613-3C(2.0-4.0)         3         ug/kg         SW846 8260B           Toluene         97.5 J         100         14         ug/kg         SW846 8260B           Ethylbenzene         26900         2500         440         ug/kg         SW846 8260B           Xylene (total)         86400         2500         440         ug/kg         SW846 8260B           Methyl Tert Butyl Ether         43.0 J         100         34         ug/kg         SW846 8260B		3180	72	20		
Cobalt         10.1         5.9         0.078         mg/kg         SW846 6010C           Lead         20.7         2.4         0.25         mg/kg         SW846 6010C           Nickel         18.2         4.7         0.094         mg/kg         SW846 6010C           Vanadium         30.4         5.9         0.087         mg/kg         SW846 6010C           Zinc         183         2.4         0.28         mg/kg         SW846 6010C           JB54991-6         MH613-3C(2.0-4.0)           Benzene         9130         100         13         ug/kg         SW846 8260B           Toluene         97.5 J         100         14         ug/kg         SW846 8260B           Ethylbenzene         26900         2500         440         ug/kg         SW846 8260B           Xylene (total)         86400         2500         440         ug/kg         SW846 8260B           Methyl Tert Butyl Ether         43.0 J         100         34         ug/kg         SW846 8260B			36			
Lead       20.7       2.4       0.25       mg/kg       SW846 6010C         Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6         MH613-3C(2.0-4.0)         Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B		10.1	5.9	0.078		SW846 6010C
Nickel       18.2       4.7       0.094       mg/kg       SW846 6010C         Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6         MH613-3C(2.0-4.0)         Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B	Lead	20.7	2.4	0.25		SW846 6010C
Vanadium       30.4       5.9       0.087       mg/kg       SW846 6010C         Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6       MH613-3C(2.0-4.0)         Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B		18.2				SW846 6010C
Zinc       183       2.4       0.28       mg/kg       SW846 6010C         JB54991-6       MH613-3C(2.0-4.0)         Benzene       9130       100       13       ug/kg       SW846 8260B         Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B	Vanadium			0.087		
JB54991-6 MH613-3C(2.0-4.0)  Benzene 9130 100 13 ug/kg SW846 8260B Toluene 97.5 J 100 14 ug/kg SW846 8260B Ethylbenzene 26900 2500 440 ug/kg SW846 8260B Xylene (total) 86400 2500 440 ug/kg SW846 8260B Methyl Tert Butyl Ether 43.0 J 100 34 ug/kg SW846 8260B						
Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B	JB54991-6 MH613-3C(2.0-4	.0)				
Toluene       97.5 J       100       14       ug/kg       SW846 8260B         Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B	Renzene	9130	100	13	แơ/kơ	SW846 8260R
Ethylbenzene       26900       2500       440       ug/kg       SW846 8260B         Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B						
Xylene (total)       86400       2500       440       ug/kg       SW846 8260B         Methyl Tert Butyl Ether       43.0 J       100       34       ug/kg       SW846 8260B						
Methyl Tert Butyl Ether 43.0 J 100 34 ug/kg SW846 8260B						
5240 300 16 ug/kg 50040 6200В						
	Sec-Datymenzene	3240	300	10	ug/ kg	344040 0%UUD



Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

Lab Sample ID Client Sample ID	Result/				
Analyte	Qual	RL	MDL	Units	Method
Cyclohexane	328000	12000	640	ug/kg	SW846 8260B
Hexane	92200	12000	1300	ug/kg	SW846 8260B
Isopropylbenzene	5100	500	15	ug/kg	SW846 8260B
Naphthalene	6860	500	18	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	51000	12000	400	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	19600	500	22	ug/kg	SW846 8260B
1,1'-Biphenyl	316	76	4.4	ug/kg	SW846 8270D
bis(2-Ethylhexyl)phthalate	60.8 J	76	33	ug/kg	SW846 8270D
Fluoranthene	28.1 J	38	17	ug/kg	SW846 8270D
Fluorene	39.9	38	12	ug/kg	SW846 8270D
2-Methylnaphthalene	5930	300	84	ug/kg	SW846 8270D
Naphthalene	3160	38	10	ug/kg	SW846 8270D
Phenanthrene	25.2 J	38	17	ug/kg	SW846 8270D
Pyrene	32.5 J	38	15	ug/kg ug/kg	SW846 8270D
Cobalt	8.9	5.3	0.070	mg/kg	SW846 6010C
Lead	31.8	2.1	0.23	mg/kg	SW846 6010C
Nickel	17.1	4.3	0.084	mg/kg	SW846 6010C
Vanadium	29.7	5.3	0.078	mg/kg	SW846 6010C
Zinc	312	2.1	0.25	mg/kg mg/kg	SW846 6010C
JB55122-1 MH613-4C(1.0)	0 5	E 4	0.079		CWOAR COLOC
Cobalt	8.5	5.4	0.072	mg/kg	SW846 6010C
Lead	28.5	2.2	0.23	mg/kg	SW846 6010C
Nickel	17.8	4.3	0.086	mg/kg	SW846 6010C
Vanadium	34.2	5.4	0.079	mg/kg	SW846 6010C
Zinc	252	2.2	0.25	mg/kg	SW846 6010C
JB55122-2 MH613-4C(3.5)					
sec-Butylbenzene	0.71 J	4.8	0.17	ug/kg	SW846 8260B
tert-Butylbenzene	0.95 J	4.8	0.16	ug/kg	SW846 8260B
Cyclohexane	0.69 J	4.8	0.24	ug/kg	SW846 8260B
Isopropylbenzene	0.46 J	4.8	0.14	ug/kg	SW846 8260B
Naphthalene	0.86 J	4.8	0.17	ug/kg	SW846 8260B
bis(2-Ethylhexyl)phthalate	48.0 J	77	34	ug/kg	SW846 8270D
Cobalt	8.7	6.4	0.085	mg/kg	SW846 6010C
Lead	73.4	2.6	0.27	mg/kg	SW846 6010C
Nickel	22.0	5.1	0.10	mg/kg	SW846 6010C
Vanadium	26.8	6.4	0.093	mg/kg	SW846 6010C
Zinc	1130	2.6	0.30	mg/kg	SW846 6010C
JB55122-3 MH613-5C(1.5)				88	
Toluene	4210	97	14	บด/ka	40968 3V8WS
1 Oluche	761U	ฮเ	14	ug/kg	SW846 8260B



Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

Lab Sample ID - Client Samp Analyte	le ID Result/ Qual	RL	MDL	Units	Method
Anaiyte	Quai	KL	MDL	Units	Method
Ethylbenzene	15500	97	17	ug/kg	SW846 8260B
Xylene (total)	263000	1900	350	ug/kg	SW846 8260B
Isopropylbenzene	207 J	490	14	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	328 J	490	16	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	152 J	490	22	ug/kg	SW846 8260B
2,4-Dimethylphenol	535	190	62	ug/kg	SW846 8270D
2-Methylphenol	62.6 J	74	42	ug/kg	SW846 8270D
3&4-Methylphenol	73.2 J	74	47	ug/kg	SW846 8270D
Benzo(a)anthracene	23.9 J	37	12	ug/kg	SW846 8270D
Benzo(a)pyrene	19.7 J	37	11	ug/kg	SW846 8270D
Benzo(b)fluoranthene	28.9 J	37	12	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	23.7 J	37	14	ug/kg	SW846 8270D
Chrysene	27.3 J	37	13	ug/kg	SW846 8270D
Fluoranthene	44.1	37	16	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene	16.3 J	37	13	ug/kg	SW846 8270D
Phenanthrene	32.2 J	37	17	ug/kg	SW846 8270D
Pyrene	37.4	37	14	ug/kg	SW846 8270D
Cobalt	8.1	5.6	0.073	mg/kg	SW846 6010C
Lead	15.1	2.2	0.24	mg/kg	SW846 6010C
Nickel	15.1	4.5	0.088	mg/kg	SW846 6010C
Vanadium	33.0	5.6	0.081	mg/kg	SW846 6010C
Zinc	51.9	2.2	0.26	mg/kg	SW846 6010C
JB55122-4 MH613-5C(3	3.0)				
Toluene	7660	110	16	ug/kg	SW846 8260B
Ethylbenzene	8080	110	20	ug/kg ug/kg	SW846 8260B
Xylene (total)	93300	1100	200	ug/kg ug/kg	SW846 8260B
Isopropylbenzene	73.5 J	560	17	ug/kg ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	123 J	560	18	ug/kg ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	27.3 J	560	25	ug/kg ug/kg	SW846 8260B
2,4-Dimethylphenol	186 J	190	64	ug/kg ug/kg	SW846 8270D
Anthracene	33.4 J	38	13	ug/kg ug/kg	SW846 8270D
Benzo(a)anthracene	34.9 J	38	12	ug/kg ug/kg	SW846 8270D
Benzo(a)pyrene	21.9 J	38	12		SW846 8270D
				ug/kg	
Benzo(b)fluoranthene	28.1 J	38	13	ug/kg	SW846 8270D SW846 8270D
Benzo(g,h,i)perylene	22.5 J	38	14	ug/kg	
Chrysene	30.0 J	38	13	ug/kg	SW846 8270D
Fluoranthene	106	38	17	ug/kg	SW846 8270D
Fluorene	26.1 J	38	12	ug/kg	SW846 8270D
Phenanthrene	121	38	17	ug/kg	SW846 8270D
Pyrene	112	38	15	ug/kg	SW846 8270D
Cobalt	7.2	6.0	0.079	mg/kg	SW846 6010C
Lead	18.8	2.4	0.25	mg/kg	SW846 6010C
Nickel	14.4	4.8	0.094	mg/kg	SW846 6010C



Stantec Consulting Services Inc. Sunoco - Marcus Hook Facility, PA 12/05/13 thru 12/09/13 Account: **Project:** 

Lab Sample ID Client Sample ID Analyte		RL	MDL	Units	Method
Analyte	Qual	KL	MIDL	Units	Method
Vanadium	31.2	6.0	0.087	mg/kg	SW846 6010C
Zinc	61.7	2.4	0.28	mg/kg	SW846 6010C
JB55122-5 MH613-1C(1.0)					
Ethylbenzene	0.35 J	0.98	0.17	ug/kg	SW846 8260B
Xylene (total)	1.1	0.98	0.17	ug/kg	SW846 8260B
Cobalt	4.3 B	6.4	0.085	mg/kg	SW846 6010C
Lead	11.6	2.6	0.27	mg/kg	SW846 6010C
Nickel	14.5	5.2	0.10	mg/kg	SW846 6010C
Vanadium	28.9	6.4	0.094	mg/kg	SW846 6010C
Zinc	44.9	2.6	0.30	mg/kg	SW846 6010C
JB55122-6 MH613-1C(3.5)					
Benzene	33.1 J	100	13	ug/kg	SW846 8260B
Ethylbenzene	308	100	17	ug/kg	SW846 8260B
Xylene (total)	1420	100	18	ug/kg	SW846 8260B
sec-Butylbenzene	1930	500	18	ug/kg	SW846 8260B
tert-Butylbenzene	332 J	500	16	ug/kg	SW846 8260B
Cyclohexane	13500	500	26	ug/kg	SW846 8260B
Isopropylbenzene	701	500	15	ug/kg	SW846 8260B
2-Methylnaphthalene	42.3 J	73	20	ug/kg	SW846 8270D
Cobalt	5.2 B	6.0	0.079	mg/kg	SW846 6010C
Lead	8.7	2.4	0.25	mg/kg	SW846 6010C
Nickel	10.1	4.8	0.094	mg/kg	SW846 6010C
Vanadium	32.0	6.0	0.087	mg/kg	SW846 6010C
Zinc	36.5	2.4	0.28	mg/kg	SW846 6010C
JB55122-7 MH614-3C(1.5)					
Ethylbenzene	0.38 J	0.96	0.17	ug/kg	SW846 8260B
Xylene (total)	2.4	0.96	0.17	ug/kg	SW846 8260B
Isopropylbenzene	0.84 J	4.8	0.14	ug/kg	SW846 8260B
Lead	31.7	2.4	0.25	mg/kg	SW846 6010C
JB55122-8 MH614-3C(3.4)					
Benzene	30.0 J	100	13	ug/kg	SW846 8260B
Toluene	6180	100	14	ug/kg	SW846 8260B
Ethylbenzene	817000	10000	1800	ug/kg	SW846 8260B
Xylene (total)	13400000	50000	9000	ug/kg	SW846 8260B
Isopropylbenzene	12800	500	15	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	12200	500	16	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	8230	500	22	ug/kg	SW846 8260B
-				- 0	



## **Summary of Hits**

Job Number: JB54835

Account: Stantec Consulting Services Inc.
Project: Sunoco - Marcus Hook Facility, PA

Collected: 12/05/13 thru 12/09/13

Lab Sample ID Client Sample ID	Docult/				
Analyte	Qual	RL	MDL	Units	Method
Fluorene a	22.2 J	120	16	ug/kg	SW846 8270D
Naphthalene <sup>a</sup>	279	120	19	ug/kg	SW846 8270D
Pyrene <sup>a</sup>	15.9 J	120	14	ug/kg	SW846 8270D
Lead	30.1	2.5	0.26	mg/kg	SW846 6010C
JB55122-9 MH615-3C(1.0)					
Benzene	15400	110	14	ug/kg	SW846 8260B
Toluene	150	0.95	0.13	ug/kg	SW846 8260B
Ethylbenzene	9.3	0.95	0.17	ug/kg	SW846 8260B
Xylene (total)	4210	110	20	ug/kg	SW846 8260B
Isopropylbenzene	0.93 J	4.8	0.14	ug/kg	SW846 8260B
1,2,4-Trimethylbenzene	93.2	4.8	0.15	ug/kg	SW846 8260B
1,3,5-Trimethylbenzene	51.6	4.8	0.21	ug/kg	SW846 8260B
Lead	30.1	2.5	0.27	mg/kg	SW846 6010C
JB55122-10 MH615-3C(3.5)					
Benzene	43800	1100	130	ug/kg	SW846 8260B
Toluene	480	110	15	ug/kg	SW846 8260B
Ethylbenzene	911	110	19	ug/kg	SW846 8260B
Xylene (total)	456	110	19	ug/kg	SW846 8260B
Isopropylbenzene	422 J	530	16	ug/kg	SW846 8260B
Chrysene <sup>a</sup>	30.1 J	120	15	ug/kg	SW846 8270D
Phenanthrene <sup>a</sup>	76.5 J	120	16	ug/kg	SW846 8270D
Pyrene <sup>a</sup>	37.2 J	120	14	ug/kg	SW846 8270D
Lead	12.5	2.4	0.25	mg/kg	SW846 6010C

<sup>(</sup>a) Analysis performed at Accutest Laboratories, Marlborough, MA.



<sup>(</sup>b) Diluted due to high concentration of target compound.



Sample Results								
Report of Analysis								



#### 4

## **Report of Analysis**

**Client Sample ID:** MH615-1C(0.0-2.0)

 Lab Sample ID:
 JB54835-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 84.8

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 V140619.D 1 12/12/13 OTR n/a n/a VV6025

Run #2

**Initial Weight** 

Run #1 6.1 g

Run #2

#### Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	11.7	0.97	0.12	ug/kg	
108-88-3	Toluene	54.2	0.97	0.14	ug/kg	
100-41-4	Ethylbenzene	2.9	0.97	0.17	ug/kg	
1330-20-7	Xylene (total)	25.1	0.97	0.17	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.97	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.97	0.31	ug/kg	
98-82-8	Isopropylbenzene	ND	4.8	0.14	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	0.28	4.8	0.15	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	4.8	0.21	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	91%		59-13	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	<b>82</b> %		65-12	23%	
2037-26-5	Toluene-D8	104%		80-12	24%	
460-00-4	4-Bromofluorobenzene	96%		71-13	<b>32</b> %	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



### +

## **Report of Analysis**

Client Sample ID: MH615-1C(0.0-2.0)

 Lab Sample ID:
 JB54835-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 84.8

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 F31216.D 1 12/10/13 JL 12/06/13 OP71216 EF5479

Run #2

Run #1 Initial Weight Final Volume 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	37	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	37	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	37	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	37	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	37	14	ug/kg	
218-01-9	Chrysene	ND	37	13	ug/kg	
86-73-7	Fluorene	ND	37	12	ug/kg	
91-20-3	Naphthalene	ND	37	10	ug/kg	
85-01-8	Phenanthrene	ND	37	17	ug/kg	
129-00-0	Pyrene	16.6	37	14	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	77%		10-1	10%	
321-60-8	2-Fluorobiphenyl	80%		17-1	10%	
1718-51-0	Terphenyl-d14	88%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \mbox{ Indicates analyte found in associated method blank } \\ N = \mbox{ Indicates presumptive evidence of a compound}$ 



## 4

## **Report of Analysis**

Client Sample ID: MH615-1C(0.0-2.0)

 Lab Sample ID:
 JB54835-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 84.8

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53191.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Initial Weight Final Volume Run #1 30.5 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 113%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 107%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



## **Report of Analysis**

Client Sample ID: MH615-1C(0.0-2.0)

Lab Sample ID: JB54835-1 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/05/13
Percent Solids: 84.8

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 19.1 0.9212/10/13 12/10/13 AMA SW846 6010C <sup>1</sup> 0.15mg/kg 1

(1) Instrument QC Batch: M:MA16545(2) Prep QC Batch: M:MP22232

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



#### 4

## **Report of Analysis**

Client Sample ID: MH615-1C(2.0-4.0)

 Lab Sample ID:
 JB54835-2
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 84.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 V140617.D 1 12/12/13 OTR n/a n/a VV6025

Run #2

**Initial Weight** 

Run #1 6.8 g

Run #2

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.29	0.87	0.11	ug/kg	J
108-88-3	Toluene	6.8	0.87	0.12	ug/kg	
100-41-4	Ethylbenzene	0.37	0.87	0.15	ug/kg	J
1330-20-7	Xylene (total)	2.8	0.87	0.15	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.87	0.30	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.87	0.28	ug/kg	
98-82-8	Isopropylbenzene	ND	4.3	0.13	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	4.3	0.14	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	4.3	0.19	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	91%		59-13	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	84%		65-12	23%	
2037-26-5	Toluene-D8	103%		80-12	24%	
460-00-4	4-Bromofluorobenzene	96%		71-13	<b>32</b> %	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



## **Report of Analysis**

Client Sample ID: MH615-1C(2.0-4.0)

Lab Sample ID: JB54835-2 **Date Sampled:** 12/05/13 SO - Soil Matrix: Date Received: 12/05/13 Method: SW846 8270D SW846 3550C Percent Solids: 84.7

Sunoco - Marcus Hook Facility, PA **Project:** 

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** P80572.D 12/06/13 OP71216 EP3432 Run #1 1 12/07/13 AD

Run #2

**Final Volume Initial Weight** Run #1 30.7 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	38	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	14	ug/kg	
218-01-9	Chrysene	ND	38	13	ug/kg	
86-73-7	Fluorene	ND	38	13	ug/kg	
91-20-3	Naphthalene	ND	38	10	ug/kg	
85-01-8	Phenanthrene	ND	38	17	ug/kg	
129-00-0	Pyrene	24.4	38	15	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	107%		10-1	10%	
321-60-8	2-Fluorobiphenyl	99%		17-1	10%	
1718-51-0	Terphenyl-d14	103%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



## **Report of Analysis**

Client Sample ID: MH615-1C(2.0-4.0)

 Lab Sample ID:
 JB54835-2
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 84.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53192.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Initial Weight Final Volume
Run #1 30.7 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 121%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 119%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



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## **Report of Analysis**

Client Sample ID: MH615-1C(2.0-4.0)

Lab Sample ID: JB54835-2 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/05/13
Percent Solids: 84.7

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 21.3 12/11/13 12/11/13 AMA SW846 6010C 1 0.940.16 mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



#### 4

## **Report of Analysis**

Client Sample ID: MH615-2C(0.0-2.0)

 Lab Sample ID:
 JB54835-3
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 86.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 E210639.D 1 12/12/13 HSS n/a n/a VE9244

Run #2

Initial Weight Final Volume Methanol Aliquot
Run #1 5.7 g 10.0 ml 20.0 ul
Run #2

#### Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	61700	550	69	ug/kg	
108-88-3	Toluene	75100	550	77	ug/kg	
100-41-4	Ethylbenzene	8540	550	95	ug/kg	
1330-20-7	Xylene (total)	59200	550	97	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	550	190	ug/kg	
107-06-2	1,2-Dichloroethane	ND	550	170	ug/kg	
98-82-8	Isopropylbenzene	817	2700	80	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	18500	2700	87	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	5920	2700	120	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	88%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	83%		65-1	23%	
2037-26-5	Toluene-D8	96%		80-1	24%	
460-00-4	4-Bromofluorobenzene	89%		71-1	32%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



#### 4

## **Report of Analysis**

Client Sample ID: MH615-2C(0.0-2.0)

 Lab Sample ID:
 JB54835-3
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 86.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80573.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 31.7 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	36	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	36	12	ug/kg	
50-32-8	Benzo(a)pyrene	20.9	36	11	ug/kg	J
205-99-2	Benzo(b)fluoranthene	ND	36	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	26.6	36	14	ug/kg	J
218-01-9	Chrysene	ND	36	12	ug/kg	
86-73-7	Fluorene	ND	36	12	ug/kg	
91-20-3	Naphthalene	132	36	9.9	ug/kg	
85-01-8	Phenanthrene	26.4	36	17	ug/kg	J
129-00-0	Pyrene	30.4	36	14	ug/kg	J
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	n# 2 Limits		
4165-60-0	Nitrobenzene-d5	98%		10-1	10%	
321-60-8	2-Fluorobiphenyl	89%		17-1	10%	
1718-51-0	Terphenyl-d14	89%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



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Page 1 of 1

## **Report of Analysis**

Client Sample ID: MH615-2C(0.0-2.0)

 Lab Sample ID:
 JB54835-3
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 86.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53193.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Initial Weight Final Volume Run #1 30.9 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.8 1.0 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 115%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 113%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



## 4

## **Report of Analysis**

Client Sample ID: MH615-2C(0.0-2.0)

Lab Sample ID: JB54835-3 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/05/13
Percent Solids: 86.6

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 14.2 0.9212/11/13 12/11/13 AMA SW846 6010C 1 0.15mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



### +

## **Report of Analysis**

Client Sample ID: MH615-2C(2.0-4.0)

 Lab Sample ID:
 JB54835-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 84.3

Project: Sunoco - Marcus Hook Facility, PA

]	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 a	E210640.D	1	12/12/13	HSS	n/a	n/a	VE9244

Run #2

Run #1	Initial Weight	Final Volume	Methanol Aliquot
	5.3 g	10.0 ml	100 ul
Run #2			

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	10300	120	15	ug/kg	
108-88-3	Toluene	3800	120	17	ug/kg	
100-41-4	Ethylbenzene	208	120	21	ug/kg	
1330-20-7	Xylene (total)	1510	120	22	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	120	42	ug/kg	
107-06-2	1,2-Dichloroethane	ND	120	39	ug/kg	
98-82-8	Isopropylbenzene	45.8	610	18	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	449	610	19	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	162	610	27	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	88%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	83%		65-1	23%	
2037-26-5	Toluene-D8	97%		80-1	24%	
460-00-4	4-Bromofluorobenzene	89%		71-1	32%	

(a) Diluted due to high concentration of target compound.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



## 4

## **Report of Analysis**

Client Sample ID: MH615-2C(2.0-4.0)

 Lab Sample ID:
 JB54835-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 84.3

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80574.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 30.6 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	39	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	39	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	39	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	39	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	39	14	ug/kg	
218-01-9	Chrysene	ND	39	13	ug/kg	
86-73-7	Fluorene	ND	39	13	ug/kg	
91-20-3	Naphthalene	ND	39	11	ug/kg	
85-01-8	Phenanthrene	19.2	39	18	ug/kg	J
129-00-0	Pyrene	ND	39	15	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2 Limits		its	
4165-60-0	Nitrobenzene-d5	96%		10-1	10%	
321-60-8	2-Fluorobiphenyl	87%		17-1	10%	
1718-51-0	Terphenyl-d14	93%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



## 4

## **Report of Analysis**

Client Sample ID: MH615-2C(2.0-4.0)

 Lab Sample ID:
 JB54835-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 84.3

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53194.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Run #1 30.1 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 118%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 117%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# 4

# **Report of Analysis**

Client Sample ID: MH615-2C(2.0-4.0)

Lab Sample ID: JB54835-4 Date Sampled: 12/05/13 Matrix: SO - Soil Date Received: 12/05/13 Percent Solids: 84.3

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 7.2 0.9512/11/13 12/11/13 AMA SW846 6010C 1 0.16mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



# **Report of Analysis**

Client Sample ID: MH615-4C(0.0-2.0)

 Lab Sample ID:
 JB54835-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 V140618.D 1 12/12/13 OTR n/a n/a VV6025

Run #2

**Initial Weight** 

Run #1 6.9 g

Run #2

#### Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	11.9	0.85	0.11	ug/kg	
108-88-3	Toluene	17.2	0.85	0.12	ug/kg	
100-41-4	Ethylbenzene	2.0	0.85	0.15	ug/kg	
1330-20-7	Xylene (total)	13.3	0.85	0.15	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.85	0.29	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.85	0.27	ug/kg	
98-82-8	Isopropylbenzene	0.21	4.2	0.12	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	3.2	4.2	0.14	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	1.1	4.2	0.19	ug/kg	J
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limit	ts	
1868-53-7	Dibromofluoromethane	91%		59-13	<b>0</b> %	
17060-07-0	1,2-Dichloroethane-D4	82%		65-12	3%	
2037-26-5	Toluene-D8	105%		80-12	4%	
460-00-4	4-Bromofluorobenzene	97%		71-13	<b>2</b> %	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# **Report of Analysis**

Client Sample ID: MH615-4C(0.0-2.0)

 Lab Sample ID:
 JB54835-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80575.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 34.5 g 1.0 ml

Run #2

**BN Special List** 

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	34	12	ug/kg	
56-55-3	Benzo(a)anthracene	ND	34	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	34	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	34	11	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	34	13	ug/kg	
218-01-9	Chrysene	ND	34	11	ug/kg	
86-73-7	Fluorene	ND	34	11	ug/kg	
91-20-3	Naphthalene	ND	34	9.2	ug/kg	
85-01-8	Phenanthrene	ND	34	15	ug/kg	
129-00-0	Pyrene	17.4	34	13	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
4165-60-0	Nitrobenzene-d5	93%		10-1	10%	
321-60-8	2-Fluorobiphenyl	88%		17-1	10%	
1718-51-0	Terphenyl-d14	90%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



### **Report of Analysis**

Client Sample ID: MH615-4C(0.0-2.0)

 Lab Sample ID:
 JB54835-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53195.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Initial Weight Final Volume Run #1 30.6 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 108%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 109%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



# 4

# **Report of Analysis**

Client Sample ID: MH615-4C(0.0-2.0)

Lab Sample ID: JB54835-5 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/05/13
Percent Solids: 85.7

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** Lead a SW846 3050B <sup>2</sup> 27.7 0.9312/11/13 12/11/13 AMA SW846 6010C 1 0.16mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



### 4

# **Report of Analysis**

Client Sample ID: MH615-4C(2.0-4.0)

 Lab Sample ID:
 JB54835-6
 Date Sampled: 12/05/13

 Matrix:
 SO - Soil
 Date Received: 12/05/13

 Method:
 SW846 8260B
 Percent Solids: 85.4

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 V140620.D 1 12/12/13 OTR n/a n/a VV6025

Run #2

**Initial Weight** 

Run #1 6.6 g

Run #2

#### Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	42.2	0.89	0.11	ug/kg	
108-88-3	Toluene	98.4	0.89	0.13	ug/kg	
100-41-4	Ethylbenzene	6.4	0.89	0.16	ug/kg	
1330-20-7	Xylene (total)	50.8	0.89	0.16	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.89	0.30	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.89	0.28	ug/kg	
98-82-8	Isopropylbenzene	0.25	4.4	0.13	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	3.7	4.4	0.14	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	1.3	4.4	0.20	ug/kg	J
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	89%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	81%		65-1	23%	
2037-26-5	Toluene-D8	104%		80-1	24%	
460-00-4	4-Bromofluorobenzene	97%		71-1	32%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

 $N = \ Indicates \ presumptive \ evidence \ of \ a \ compound$ 



# **Report of Analysis**

Client Sample ID: MH615-4C(2.0-4.0)

 Lab Sample ID:
 JB54835-6
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 85.4

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80576.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 31.5 g 1.0 ml

Run #2

### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	37	13	ug/kg	
56-55-3	Benzo(a)anthracene	18.5	37	12	ug/kg	J
50-32-8	Benzo(a)pyrene	18.3	37	11	ug/kg	J
205-99-2	Benzo(b)fluoranthene	20.4	37	12	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	19.9	37	14	ug/kg	J
218-01-9	Chrysene	16.2	37	13	ug/kg	J
86-73-7	Fluorene	ND	37	12	ug/kg	
91-20-3	Naphthalene	ND	37	10	ug/kg	
85-01-8	Phenanthrene	18.3	37	17	ug/kg	J
129-00-0	Pyrene	68.8	37	14	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	101%		10-1	10%	
321-60-8	2-Fluorobiphenyl	91%		17-1	10%	
1718-51-0	Terphenyl-d14	93%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



### **Report of Analysis**

Client Sample ID: MH615-4C(2.0-4.0)

 Lab Sample ID:
 JB54835-6
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 85.4

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53196.D 1 12/12/13 AMA 12/11/13 M:OP36152 M:GBB3109

Run #2

Initial Weight Final Volume
Run #1 30.3 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 106%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 101%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

**Client Sample ID:** MH615-4C(2.0-4.0)

Lab Sample ID: JB54835-6 Date Sampled: 12/05/13 Matrix: SO - Soil Date Received: 12/05/13 Percent Solids: 85.4

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 25.8 0.9512/11/13 12/11/13 AMA SW846 6010C 1 0.16mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



### 4

# **Report of Analysis**

Client Sample ID: MH614-1C(0.0-2.0)

 Lab Sample ID:
 JB54835-7
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 82.0

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E210609.D	1	12/11/13	HSS	n/a	n/a	VE9241
Run #2	E210641.D	1	12/12/13	HSS	n/a	n/a	VE9244

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.5 g	10.0 ml	100 ul
Run #2	$5.5\mathrm{g}$	10.0 ml	5.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	833	120	15	ug/kg	
108-88-3	Toluene	247000 a	2400	350	ug/kg	
100-41-4	Ethylbenzene	14800	120	21	ug/kg	
1330-20-7	Xylene (total)	126000 a	2400	430	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	120	42	ug/kg	
107-06-2	1,2-Dichloroethane	ND	120	39	ug/kg	
98-82-8	Isopropylbenzene	215	610	18	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	203	610	19	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	126	610	27	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	88%	<b>87</b> %	59-1	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	84%	83%	65-1	23%	
2037-26-5	Toluene-D8	97%	96%	80-1	24%	
460-00-4	4-Bromofluorobenzene	89%	90%	71-1	<b>32</b> %	

### (a) Result is from Run# 2

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



# **Report of Analysis**

Client Sample ID: MH614-1C(0.0-2.0)

 Lab Sample ID:
 JB54835-7
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 82.0

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80577.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 32.4 g 1.0 ml

Run #2

### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	38	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	14	ug/kg	
218-01-9	Chrysene	ND	38	13	ug/kg	
86-73-7	Fluorene	ND	38	12	ug/kg	
91-20-3	Naphthalene	ND	38	10	ug/kg	
85-01-8	Phenanthrene	ND	38	17	ug/kg	
129-00-0	Pyrene	ND	38	14	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 2 Limits		
4165-60-0	Nitrobenzene-d5	98%		10-1	10%	
321-60-8	2-Fluorobiphenyl	90%		17-1	10%	
1718-51-0	Terphenyl-d14	97%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



### **Report of Analysis**

Client Sample ID: MH614-1C(0.0-2.0)

**Date Sampled: 12/05/13** Lab Sample ID: JB54835-7 Matrix: SO - Soil Date Received: 12/05/13 Method: SW846 8011 SW846 8011 **Percent Solids:** 82.0

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** M:OP36152 M:GBB3109 Run #1 a BB53198.D 1 12/12/13 **AMA** 12/11/13

Run #2

**Final Volume Initial Weight** Run #1 50.0 ml 30.3 g

Run #2

CAS No. Compound **MDL** Units Result RLQ

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

460-00-4 Bromofluorobenzene (S) 61-167% 119% 460-00-4 Bromofluorobenzene (S) 124% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



### 4

# **Report of Analysis**

Client Sample ID: MH614-1C(0.0-2.0)

Lab Sample ID: JB54835-7 Date Sampled: 12/05/13 Matrix: SO - Soil Date Received: 12/05/13 Percent Solids: 82.0

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead a 4.2 0.9812/11/13 12/11/13 AMA SW846 6010C 1 0.17 mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



# **Report of Analysis**

Client Sample ID: MH614-1C(2.0-4.0)

 Lab Sample ID:
 JB54835-8
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8260B
 Percent Solids:
 82.7

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E210610.D	1	12/11/13	HSS	n/a	n/a	VE9241
Run #2	E210642.D	1	12/12/13	HSS	n/a	n/a	VE9244

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.0 g	10.0 ml	100 ul
Run #2	6.0 g	10.0 ml	10.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	170	110	14	ug/kg	
108-88-3	Toluene	35000 a	1100	160	ug/kg	
100-41-4	Ethylbenzene	3630	110	19	ug/kg	
1330-20-7	Xylene (total)	30700	110	20	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	110	38	ug/kg	
107-06-2	1,2-Dichloroethane	ND	110	36	ug/kg	
98-82-8	Isopropylbenzene	82.9	560	16	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	164	560	18	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	80.9	560	25	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	<b>89</b> %	88%	59-1	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	83%	83%	65-1	23%	
2037-26-5	Toluene-D8	97%	96%	80-1	24%	
460-00-4	4-Bromofluorobenzene	88%	91%	71-1	<b>32</b> %	

### (a) Result is from Run# 2

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: MH614-1C(2.0-4.0)

 Lab Sample ID:
 JB54835-8
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/05/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 82.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 P80578.D 1 12/07/13 AD 12/06/13 OP71216 EP3432

Run #2

Initial Weight Final Volume Run #1 30.5 g 1.0 ml

Run #2

### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	40	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	15	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
86-73-7	Fluorene	ND	40	13	ug/kg	
91-20-3	Naphthalene	ND	40	11	ug/kg	
85-01-8	Phenanthrene	ND	40	18	ug/kg	
129-00-0	Pyrene	ND	40	15	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	93%		10-1	10%	
321-60-8	2-Fluorobiphenyl	<b>85</b> %		17-1	10%	
1718-51-0	Terphenyl-d14	96%		30-1	24%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



### **Report of Analysis**

Client Sample ID: MH614-1C(2.0-4.0)

**Date Sampled: 12/05/13** Lab Sample ID: JB54835-8 Matrix: SO - Soil Date Received: 12/05/13 Method: SW846 8011 SW846 8011 Percent Solids: 82.7

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** M:OP36152 M:GBB3109 Run #1 a BB53199.D 1 12/12/13 **AMA** 12/11/13

Run #2

**Final Volume Initial Weight** Run #1 50.0 ml 30.3 g

Run #2

CAS No. Compound Units Result RL**MDL** Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

61-167% 460-00-4 Bromofluorobenzene (S) 117% 460-00-4 Bromofluorobenzene (S) 118% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# 4

# **Report of Analysis**

Client Sample ID: MH614-1C(2.0-4.0)

Lab Sample ID: JB54835-8 Date Sampled: 12/05/13 Matrix: SO - Soil Date Received: 12/05/13 Percent Solids: 82.7

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** Lead a SW846 3050B <sup>2</sup> 0.9512/11/13 12/11/13 AMA SW846 6010C 1 6.4 0.16mg/kg 1

(1) Instrument QC Batch: M:MA16549(2) Prep QC Batch: M:MP22237

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



# **Report of Analysis**

Client Sample ID: MH614-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 A200876.D 1 12/10/13 OTR n/a n/a VA7565

Run #2

**Initial Weight** 

Run #1 5.8 g

Run #2

#### Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.13	ug/kg	
108-88-3	Toluene	0.24	1.0	0.14	ug/kg	J
100-41-4	Ethylbenzene	ND	1.0	0.18	ug/kg	
1330-20-7	Xylene (total)	0.34	1.0	0.18	ug/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.35	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.32	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.16	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.22	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	99%		<b>59-1</b> 3	<b>80</b> %	
17060-07-0	1,2-Dichloroethane-D4	<b>85</b> %		65-12	23%	
2037-26-5	Toluene-D8	101%		80-12	24%	
460-00-4	4-Bromofluorobenzene	92%		71-13	<b>32</b> %	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



# **Report of Analysis**

Client Sample ID: MH614-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8270D
 SW846 3546
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 a	W16451.D	1	12/14/13	AMA	12/11/13	M:OP36159	M:MSW734
Dun #9							

Run #2

D #1	Initial Weight	
Run #1 Run #2	20.2 g	1.0 ml

### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	120	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	120	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	120	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	120	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg	
218-01-9	Chrysene	ND	120	14	ug/kg	
86-73-7	Fluorene	ND	120	15	ug/kg	
91-20-3	Naphthalene	ND	120	18	ug/kg	
85-01-8	Phenanthrene	ND	120	16	ug/kg	
129-00-0	Pyrene	ND	120	14	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	73%		30-1	30%	
321-60-8	2-Fluorobiphenyl	77%		30-1	30%	
1718-51-0	Terphenyl-d14	92%		30-130%		

<sup>(</sup>a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



### **Report of Analysis**

Client Sample ID: MH614-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-1
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 85.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53237.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.1 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 104%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 99%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



# 4

# **Report of Analysis**

Client Sample ID: MH614-2C(0.0-2.0)

Lab Sample ID: JB54991-1 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/06/13
Percent Solids: 85.7

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	<b>Prep Method</b>
L.ead	13.5	2.5	0.26	mø/kø	1	12/14/13	12/19/13 кк	SW846 6010C 1	SW846 3050R <sup>2</sup>

(1) Instrument QC Batch: MA32897(2) Prep QC Batch: MP76642

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



Page 1 of 1

Client Sample ID: MH614-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-2
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 A200877.D 1 12/10/13 OTR n/a n/a VA7565

Run #2

**Initial Weight** 

Run #1 6.0 g

Run #2

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.88	1.0	0.13	ug/kg	J
108-88-3	Toluene	0.44	1.0	0.14	ug/kg	J
100-41-4	Ethylbenzene	ND	1.0	0.17	ug/kg	
1330-20-7	Xylene (total)	0.27	1.0	0.18	ug/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.34	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.32	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.16	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.22	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	101%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	90%		65-1	23%	
2037-26-5	Toluene-D8	103%		80-1	24%	
460-00-4	4-Bromofluorobenzene	93%		71-1	32%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH614-2C(2.0-4.0)

Lab Sample ID: JB54991-2 **Date Sampled:** 12/05/13 **Matrix:** SO - Soil Date Received: 12/06/13 Method: SW846 8270D SW846 3546 Percent Solids: 83.6

Sunoco - Marcus Hook Facility, PA **Project:** 

DF **Analytical Batch** File ID Analyzed By **Prep Date Prep Batch** M:OP36159 Run #1 a W16452.D 1 12/14/13 **AMA** 12/11/13 M:MSW734 Run #2

**Final Volume Initial Weight** Run #1 20.2 g 1.0 ml

Run #2

### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	120	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	120	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	120	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	120	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg	
218-01-9	Chrysene	ND	120	15	ug/kg	
86-73-7	Fluorene	ND	120	16	ug/kg	
91-20-3	Naphthalene	ND	120	19	ug/kg	
85-01-8	Phenanthrene	ND	120	16	ug/kg	
129-00-0	Pyrene	ND	120	14	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	73%		30-1	30%	
321-60-8	2-Fluorobiphenyl	<b>78</b> %		30-1	30%	
1718-51-0	Terphenyl-d14	92%		30-1	30%	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

**Client Sample ID:** MH614-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-2
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53238.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.8 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 84%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 86%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

**Client Sample ID: MH614-2C(2.0-4.0)** 

Lab Sample ID: JB54991-2 Date Sampled: 12/05/13 Matrix: SO - Soil Date Received: 12/06/13 Percent Solids: 83.6

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	8.4	2.4	0.25	mø/kø	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32897(2) Prep QC Batch: MP76642

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



\_\_\_\_

# **Report of Analysis**

Client Sample ID: MH613-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-3
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 82.0

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	D216116.D	1	12/12/13	$\mathbf{CM}$	n/a	n/a	VD8828
Run #2	D216161.D	1	12/13/13	CM	n/a	n/a	VD8829

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.3 g	10.0 ml	100 ul
Run #2	6.3 g	10.0 ml	10.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	110	14	ug/kg	
108-88-3	Toluene	ND	110	15	ug/kg	
100-41-4	Ethylbenzene	132	110	19	ug/kg	
1330-20-7	Xylene (total)	1260	110	19	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	110	37	ug/kg	
135-98-8	sec-Butylbenzene	156	540	19	ug/kg	J
98-06-6	tert-Butylbenzene	30.5	540	18	ug/kg	J
110-82-7	Cyclohexane	61100 a	5400	280	ug/kg	
107-06-2	1,2-Dichloroethane	ND	110	35	ug/kg	
110-54-3	Hexane	ND	540	58	ug/kg	
98-82-8	Isopropylbenzene	98.9	540	16	ug/kg	J
91-20-3	Naphthalene	330	540	20	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	4790	540	17	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	1710	540	24	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	95%	98%	59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	112%	115%	65-1	23%	
2037-26-5	Toluene-D8	139% b	114%	80-1	24%	
460-00-4	4-Bromofluorobenzene	95%	94%	71-1	32%	

<sup>(</sup>a) Result is from Run# 2

(b) Outside control limits due to matrix interference.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



### **Report of Analysis**

Client Sample ID: MH613-2C(0.0-2.0)

Lab Sample ID: JB54991-3 **Date Sampled:** 12/05/13 SO - Soil Matrix: Date Received: 12/06/13 Method: SW846 8270D SW846 3550C Percent Solids: 82.0

Sunoco - Marcus Hook Facility, PA **Project:** 

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/16/13 OP71436 EM4084 Run #1 M100157.D 1 12/19/13 KR

Run #2

**Final Volume Initial Weight** Run #1 30.5 g 1.0 ml

Run #2

### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	200	67	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	800	49	ug/kg	
95-48-7	2-Methylphenol	ND	80	46	ug/kg	
	3&4-Methylphenol	ND	80	51	ug/kg	
100-02-7	4-Nitrophenol	ND	400	68	ug/kg	
108-95-2	Phenol	ND	80	42	ug/kg	
83-32-9	Acenaphthene	ND	40	12	ug/kg	
120-12-7	Anthracene	ND	40	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	15	ug/kg	
92-52-4	1,1'-Biphenyl	ND	80	4.6	ug/kg	
218-01-9	Chrysene	ND	40	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	14	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	80	8.9	ug/kg	
84-66-2	Diethyl phthalate	ND	80	14	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	80	35	ug/kg	
206-44-0	Fluoranthene	ND	40	18	ug/kg	
86-73-7	Fluorene	ND	40	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	14	ug/kg	
91-57-6	2-Methylnaphthalene	ND	80	22	ug/kg	
91-20-3	Naphthalene	ND	40	11	ug/kg	
85-01-8	Phenanthrene	ND	40	18	ug/kg	
129-00-0	Pyrene	ND	40	15	ug/kg	
110-86-1	Pyridine	ND	80	16	ug/kg	
91-22-5	Quinoline	ND	200	38	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
267_19_4	2-Fluorophonol	<b>Q9</b> 0/ <sub>2</sub>		12_1	10%	

2-Fluorophenol 367-12-4 **82**% 13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-3
 Date Sampled: 12/05/13

 Matrix:
 SO - Soil
 Date Received: 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 82.0

Project: Sunoco - Marcus Hook Facility, PA

### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	80%		15-110%
118-79-6	2,4,6-Tribromophenol	95%		20-123%
4165-60-0	Nitrobenzene-d5	<b>74</b> %		10-110%
321-60-8	2-Fluorobiphenyl	<b>68</b> %		<b>17-110</b> %
1718-51-0	Terphenyl-d14	86%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH613-2C(0.0-2.0)

 Lab Sample ID:
 JB54991-3
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 82.0

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53240.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume
Run #1 30.4 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 112%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 111%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# **Report of Analysis**

**Client Sample ID:** MH613-2C(0.0-2.0)

Lab Sample ID: JB54991-3 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/06/13
Percent Solids: 82.0

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	13.4	6.4	0.084	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	8.9	2.6	0.27	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.9	5.1	0.10	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.6	6.4	0.093	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	49.8	2.6	0.30	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32897(2) Prep QC Batch: MP76642

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



Page 1 of 1

**Client Sample ID:** MH613-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 81.3

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	D216117.D	1	12/12/13	CM	n/a	n/a	VD8828
Run #2 a	D216162.D	1	12/13/13	CM	n/a	n/a	VD8829

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.8 g	10.0 ml	100 ul
Run #2	5.8 g	10.0 ml	100 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	120	15	ug/kg	
108-88-3	Toluene	ND	120	17	ug/kg	
100-41-4	Ethylbenzene	40.8	120	21	ug/kg	J
1330-20-7	Xylene (total)	ND	120	21	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	120	40	ug/kg	
135-98-8	sec-Butylbenzene	123	590	21	ug/kg	J
98-06-6	tert-Butylbenzene	40.9	590	19	ug/kg	J
110-82-7	Cyclohexane	8000	590	30	ug/kg	
107-06-2	1,2-Dichloroethane	ND	120	38	ug/kg	
110-54-3	Hexane	ND	590	63	ug/kg	
98-82-8	Isopropylbenzene	314	590	17	ug/kg	J
91-20-3	Naphthalene	ND	590	21	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	113	590	19	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	45.5	590	26	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lin	nits	
1868-53-7	Dibromofluoromethane	95%	95%	59-	130%	
17060-07-0	1,2-Dichloroethane-D4	108%	112%	65-	123%	
2037-26-5	Toluene-D8	138% b	139% b	80-	124%	
460-00-4	4-Bromofluorobenzene	96%	96%	71-	132%	

- (a) Confirmation run for surrogate recoveries.
- (b) outside control limits due to matrix interference.

ND = Not detected MD

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 2

**Client Sample ID:** MH613-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 81.3

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 M100158.D 1 12/19/13 KR 12/16/13 OP71436 EM4084

Run #2

Initial Weight Final Volume

Run #1 31.5 g 1.0 ml

Run #2

**ABN Special List** 

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	200	66	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	780	48	ug/kg	
95-48-7	2-Methylphenol	ND	78	45	ug/kg	
	3&4-Methylphenol	ND	78	<b>50</b>	ug/kg	
100-02-7	4-Nitrophenol	ND	390	66	ug/kg	
108-95-2	Phenol	ND	78	41	ug/kg	
83-32-9	Acenaphthene	ND	39	11	ug/kg	
120-12-7	Anthracene	ND	39	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	39	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	39	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	39	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	39	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	39	15	ug/kg	
92-52-4	1,1'-Biphenyl	ND	78	4.5	ug/kg	
218-01-9	Chrysene	ND	39	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	39	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	78	8.7	ug/kg	
84-66-2	Diethyl phthalate	ND	78	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	54.9	78	34	ug/kg	J
206-44-0	Fluoranthene	ND	39	17	ug/kg	
86-73-7	Fluorene	ND	39	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	39	14	ug/kg	
91-57-6	2-Methylnaphthalene	58.4	78	22	ug/kg	J
91-20-3	Naphthalene	ND	39	11	ug/kg	
85-01-8	Phenanthrene	ND	39	18	ug/kg	
129-00-0	Pyrene	22.8	39	15	ug/kg	J
110-86-1	Pyridine	ND	78	16	ug/kg	
91-22-5	Quinoline	ND	200	37	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	

367-12-4 2-Fluorophenol 85% 13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-4
 Date Sampled: 12/05/13

 Matrix:
 SO - Soil
 Date Received: 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 81.3

Project: Sunoco - Marcus Hook Facility, PA

### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	87%		<b>15-110</b> %
118-79-6	2,4,6-Tribromophenol	95%		20-123%
4165-60-0	Nitrobenzene-d5	<b>76</b> %		10-110%
321-60-8	2-Fluorobiphenyl	<b>70</b> %		<b>17-110</b> %
1718-51-0	Terphenyl-d14	92%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

 $N = \ Indicates \ presumptive \ evidence \ of \ a \ compound$ 

Page 1 of 1

**Client Sample ID:** MH613-2C(2.0-4.0)

 Lab Sample ID:
 JB54991-4
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 81.3

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53241.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.3 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 118%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 103%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# **Report of Analysis**

**Client Sample ID:** MH613-2C(2.0-4.0)

Lab Sample ID: JB54991-4 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/06/13
Percent Solids: 81.3

Project: Sunoco - Marcus Hook Facility, PA

### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	11.0	6.0	0.080	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	7.1	2.4	0.26	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.6	4.8	0.095	mg/kg		12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	28.0	6.0	0.088	mg/kg		12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	36.5	2.4	0.28	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32897(2) Prep QC Batch: MP76642

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



RL = Reporting Limit

Page 1 of 1

Client Sample ID: MH613-3C(0.0-2.0)

 Lab Sample ID:
 JB54991-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 84.5

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
Run #1	D216118.D	1	12/12/13	CM	n/a	n/a	VD8828
Run #2	D216160.D	1	12/13/13	CM	n/a	n/a	VD8829

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.3 g	10.0 ml	100 ul
Run #2	6.3 g	10.0 ml	5.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	3210	100	13	ug/kg	
108-88-3	Toluene	101	100	15	ug/kg	
100-41-4	Ethylbenzene	9120	100	18	ug/kg	
1330-20-7	Xylene (total)	67000 a	2100	370	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	35	ug/kg	
135-98-8	sec-Butylbenzene	2310	520	19	ug/kg	
98-06-6	tert-Butylbenzene	ND	520	17	ug/kg	
110-82-7	Cyclohexane	215000 a	10000	530	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	33	ug/kg	
110-54-3	Hexane	69800 a	10000	1100	ug/kg	
98-82-8	Isopropylbenzene	2520	520	15	ug/kg	
91-20-3	Naphthalene	4950	520	19	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	37400 a	10000	330	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	16800	520	23	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	95%	97%	59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	118%	113%	65-1	23%	
2037-26-5	Toluene-D8	269% b	118%	80-1	24%	
460-00-4	4-Bromofluorobenzene	122%	93%	71-1	32%	

<sup>(</sup>a) Result is from Run# 2

(b) Outside control limits due to matrix interference.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



## **Report of Analysis**

Client Sample ID: MH613-3C(0.0-2.0)

 Lab Sample ID:
 JB54991-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 84.5

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 M100159.D 1 12/19/13 KR 12/16/13 OP71436 EM4084

Run #2

Initial Weight Final Volume Run #1 33.1 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	180	60	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	720	44	ug/kg	
95-48-7	2-Methylphenol	ND	72	41	ug/kg	
	3&4-Methylphenol	ND	72	45	ug/kg	
100-02-7	4-Nitrophenol	ND	360	60	ug/kg	
108-95-2	Phenol	ND	72	38	ug/kg	
83-32-9	Acenaphthene	ND	36	10	ug/kg	
120-12-7	Anthracene	ND	36	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	36	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	36	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	36	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	36	13	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	36	13	ug/kg	
92-52-4	1,1'-Biphenyl	196	72	4.1	ug/kg	
218-01-9	Chrysene	ND	36	12	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	36	12	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	72	7.9	ug/kg	
84-66-2	Diethyl phthalate	ND	72	12	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	51.4	72	32	ug/kg	J
206-44-0	Fluoranthene	ND	36	16	ug/kg	
86-73-7	Fluorene	ND	36	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	36	12	ug/kg	
91-57-6	2-Methylnaphthalene	3180	72	20	ug/kg	
91-20-3	Naphthalene	ND	36	9.8	ug/kg	
85-01-8	Phenanthrene	ND	36	16	ug/kg	
129-00-0	Pyrene	18.3	36	14	ug/kg	J
110-86-1	Pyridine	ND	72	14	ug/kg	
91-22-5	Quinoline	ND	180	34	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	

ND = Not detected

367-12-4

MDL = Method Detection Limit

**83**%

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

2-Fluorophenol

J = Indicates an estimated value

13-110%

B = Indicates analyte found in associated method blank

#### Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-3C(0.0-2.0)

 Lab Sample ID:
 JB54991-5
 Date Sampled: 12/05/13

 Matrix:
 SO - Soil
 Date Received: 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 84.5

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	82%		<b>15-110</b> %
118-79-6	2,4,6-Tribromophenol	93%		20-123%
4165-60-0	Nitrobenzene-d5	94%		10-110%
321-60-8	2-Fluorobiphenyl	<b>78</b> %		17-110%
1718-51-0	Terphenyl-d14	88%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \mbox{ Indicates analyte found in associated method blank } \\ N = \mbox{ Indicates presumptive evidence of a compound}$ 



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Page 1 of 1

Client Sample ID: MH613-3C(0.0-2.0)

 Lab Sample ID:
 JB54991-5
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 84.5

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53242.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.2 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 115%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 91%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Page 1 of 1

**Client Sample ID:** MH613-3C(0.0-2.0)

Lab Sample ID: JB54991-5 Date Sampled: 12/05/13
Matrix: SO - Soil Date Received: 12/06/13
Percent Solids: 84.5

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	10.1	5.9	0.078	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	20.7	2.4	0.25	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	18.2	4.7	0.094	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	30.4	5.9	0.087	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	183	2.4	0.28	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32897(2) Prep QC Batch: MP76642

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



Page 1 of 1

**Client Sample ID:** MH613-3C(2.0-4.0)

 Lab Sample ID:
 JB54991-6
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8260B
 Percent Solids:
 84.0

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
Run #1	D216119.D	1	12/12/13	CM	n/a	n/a	VD8828
Run #2	D216159.D	1	12/13/13	CM	n/a	n/a	VD8829

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.6 g	10.0 ml	100 ul
Run #2	6.6 g	10.0 ml	4.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	9130	100	13	ug/kg	
108-88-3	Toluene	97.5	100	14	ug/kg	J
100-41-4	Ethylbenzene	26900 a	2500	440	ug/kg	
1330-20-7	Xylene (total)	86400 a	2500	440	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	43.0	100	34	ug/kg	J
135-98-8	sec-Butylbenzene	3240	500	18	ug/kg	
98-06-6	tert-Butylbenzene	ND	500	16	ug/kg	
110-82-7	Cyclohexane	328000 a	12000	640	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	32	ug/kg	
110-54-3	Hexane	92200 a	12000	1300	ug/kg	
98-82-8	Isopropylbenzene	5100	500	15	ug/kg	
91-20-3	Naphthalene	6860	500	18	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	51000 a	12000	400	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	19600	500	22	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	94%	97%	59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	124% b	111%	65-1	23%	
2037-26-5	Toluene-D8	379% b	122%	80-1	24%	
460-00-4	4-Bromofluorobenzene	131%	95%	71-1	32%	

<sup>(</sup>a) Result is from Run# 2

(b) Outside control limits due to matrix interference.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# **Report of Analysis**

Client Sample ID: MH613-3C(2.0-4.0)

Lab Sample ID: JB54991-6 **Date Sampled:** 12/05/13 **Matrix:** SO - Soil Date Received: 12/06/13 Method: SW846 8270D SW846 3550C Percent Solids: 84.0

Sunoco - Marcus Hook Facility, PA **Project:** 

	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
Run #1	M100160.D	1	12/19/13	KR	12/16/13	OP71436	EM4084
Run #2	M100186.D	4	12/20/13	KR	12/16/13	OP71436	EM4086

	Initial Weight	Final Volume
Run #1	31.5 g	1.0 ml
Run #2	31.5 g	1.0 ml

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	190	63	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	760	46	ug/kg	
95-48-7	2-Methylphenol	ND	76	43	ug/kg	
	3&4-Methylphenol	ND	76	48	ug/kg	
100-02-7	4-Nitrophenol	ND	380	64	ug/kg	
108-95-2	Phenol	ND	76	40	ug/kg	
83-32-9	Acenaphthene	ND	38	11	ug/kg	
120-12-7	Anthracene	ND	38	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	14	ug/kg	
92-52-4	1,1'-Biphenyl	316	76	4.4	ug/kg	
218-01-9	Chrysene	ND	38	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	76	8.4	ug/kg	
84-66-2	Diethyl phthalate	ND	76	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	60.8	76	33	ug/kg	J
206-44-0	Fluoranthene	28.1	38	17	ug/kg	J
86-73-7	Fluorene	39.9	38	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	13	ug/kg	
91-57-6	2-Methylnaphthalene	5930 a	300	84	ug/kg	
91-20-3	Naphthalene	3160	38	10	ug/kg	
85-01-8	Phenanthrene	25.2	38	17	ug/kg	J
129-00-0	Pyrene	32.5	38	15	ug/kg	J
110-86-1	Pyridine	ND	76	15	ug/kg	
91-22-5	Quinoline	ND	190	36	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limi	its	
367-12-4	2-Fluorophenol	91%	<b>85</b> %	13-1	10%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-3C(2.0-4.0)

 Lab Sample ID:
 JB54991-6
 Date Sampled: 12/05/13

 Matrix:
 SO - Soil
 Date Received: 12/06/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 84.0

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	83%	84%	15-110%
118-79-6	2,4,6-Tribromophenol	98%	<b>87</b> %	20-123%
4165-60-0	Nitrobenzene-d5	105%	100%	10-110%
321-60-8	2-Fluorobiphenyl	<b>79</b> %	84%	17-110%
1718-51-0	Terphenyl-d14	95%	99%	30-124%

(a) Result is from Run# 2

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH613-3C(2.0-4.0)

 Lab Sample ID:
 JB54991-6
 Date Sampled:
 12/05/13

 Matrix:
 SO - Soil
 Date Received:
 12/06/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 84.0

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53243.D 1 12/13/13 AMA 12/11/13 M:OP36152 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.8 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 116%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 98%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: MH613-3C(2.0-4.0)

**Date Sampled:** 12/05/13 Lab Sample ID: JB54991-6 Date Received: 12/06/13 Matrix: SO - Soil Percent Solids: 84.0

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.9	5.3	0.070	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	31.8	2.1	0.23	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.1	4.3	0.084	mg/kg	1	12/14/13	12/19/13 KK	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	29.7	5.3	0.078	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	312	2.1	0.25	mg/kg	1	12/14/13	12/19/13 кк	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32897 (2) Prep QC Batch: MP76642

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



RL = Reporting Limit

Page 1 of 1

Client Sample ID: MH613-4C(1.0) Lab Sample ID: JB55122-1 **Matrix:** 

**Date Sampled: 12/09/13** SO - Soil Date Received: 12/09/13 SW846 8260B Percent Solids: 83.6

Sunoco - Marcus Hook Facility, PA **Project:** 

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** VY6135 Run #1 Y141661.D 1 12/14/13 PS n/a n/a

Run #2

Method:

**Initial Weight** 

Run #1 6.9 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.87	0.11	ug/kg	
108-88-3	Toluene	ND	0.87	0.12	ug/kg	
100-41-4	Ethylbenzene	ND	0.87	0.15	ug/kg	
1330-20-7	Xylene (total)	ND	0.87	0.15	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.87	0.30	ug/kg	
135-98-8	sec-Butylbenzene	ND	4.3	0.16	ug/kg	
98-06-6	tert-Butylbenzene	ND	4.3	0.14	ug/kg	
110-82-7	Cyclohexane	ND	4.3	0.22	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.87	0.28	ug/kg	
110-54-3	Hexane	ND	4.3	0.47	ug/kg	
98-82-8	Isopropylbenzene	ND	4.3	0.13	ug/kg	
91-20-3	Naphthalene	ND	4.3	0.16	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	4.3	0.14	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	4.3	0.19	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	93%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	84%		65-1	23%	
2037-26-5	Toluene-D8	101%		80-1	24%	
460-00-4	4-Bromofluorobenzene	94%		71-1	32%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Client Sample ID: MH613-4C(1.0) Lab Sample ID: JB55122-1

 Lab Sample ID:
 JB55122-1
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Z87303.D 1 12/19/13 EP 12/16/13 OP71437 EZ4368

Run #2

Initial Weight Final Volume

Run #1 31.6 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	190	64	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	760	46	ug/kg	
95-48-7	2-Methylphenol	ND	76	43	ug/kg	
	3&4-Methylphenol	ND	76	48	ug/kg	
100-02-7	4-Nitrophenol	ND	380	64	ug/kg	
108-95-2	Phenol	ND	76	40	ug/kg	
83-32-9	Acenaphthene	ND	38	11	ug/kg	
120-12-7	Anthracene	ND	38	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	14	ug/kg	
92-52-4	1,1'-Biphenyl	ND	76	4.4	ug/kg	
218-01-9	Chrysene	ND	38	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	76	8.4	ug/kg	
84-66-2	Diethyl phthalate	ND	76	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	76	33	ug/kg	
206-44-0	Fluoranthene	ND	38	17	ug/kg	
86-73-7	Fluorene	ND	38	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	13	ug/kg	
91-57-6	2-Methylnaphthalene	ND	76	21	ug/kg	
91-20-3	Naphthalene	ND	38	10	ug/kg	
85-01-8	Phenanthrene	ND	38	17	ug/kg	
129-00-0	Pyrene	ND	38	15	ug/kg	
110-86-1	Pyridine	ND	76	15	ug/kg	
91-22-5	Quinoline	ND	190	36	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
367-12-4	2-Fluorophenol	<b>70</b> %	13-110%			

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-4C(1.0)

 Lab Sample ID:
 JB55122-1
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 83.6

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	<b>69</b> %		15-110%
118-79-6	2,4,6-Tribromophenol	100%		20-123%
4165-60-0	Nitrobenzene-d5	<b>76</b> %		10-110%
321-60-8	2-Fluorobiphenyl	84%		<b>17-110</b> %
1718-51-0	Terphenyl-d14	95%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



f Analysis Page 1 of 1

 Client Sample ID:
 MH613-4C(1.0)

 Lab Sample ID:
 JB55122-1
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53253.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume
Run #1 30.4 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 122%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 112%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: MH613-4C(1.0) **Date Sampled:** 12/09/13 Lab Sample ID: JB55122-1 Matrix: SO - Soil Date Received: 12/09/13 Percent Solids: 83.6

**Project:** Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.5	5.4	0.072	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	28.5	2.2	0.23	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.8	4.3	0.086	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	34.2	5.4	0.079	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	252	2.2	0.25	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909 (2) Prep QC Batch: MP76729

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



RL = Reporting Limit

# **Report of Analysis**

 Client Sample ID:
 MH613-4C(3.5)

 Lab Sample ID:
 JB55122-2
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8260B
 Percent Solids:
 79.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Y141663.D 1 12/14/13 PS n/a n/a VY6135

Run #2

**Initial Weight** 

Run #1 6.6 g

Run #2

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.95	0.12	ug/kg	
108-88-3	Toluene	ND	0.95	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	0.95	0.17	ug/kg	
1330-20-7	Xylene (total)	ND	0.95	0.17	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.95	0.33	ug/kg	
135-98-8	sec-Butylbenzene	0.71	4.8	0.17	ug/kg	J
98-06-6	tert-Butylbenzene	0.95	4.8	0.16	ug/kg	J
110-82-7	Cyclohexane	0.69	4.8	0.24	ug/kg	J
107-06-2	1,2-Dichloroethane	ND	0.95	0.31	ug/kg	
110-54-3	Hexane	ND	4.8	0.51	ug/kg	
98-82-8	Isopropylbenzene	0.46	4.8	0.14	ug/kg	J
91-20-3	Naphthalene	0.86	4.8	0.17	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	ND	4.8	0.15	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	4.8	0.21	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	94%		59-13	30%	
17060-07-0	1,2-Dichloroethane-D4	85%		65-12	23%	
2037-26-5	Toluene-D8	101%		80-13	24%	
460-00-4	4-Bromofluorobenzene	90%		71-13	<b>32</b> %	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



**Date Sampled: 12/09/13** 

## **Report of Analysis**

Client Sample ID: MH613-4C(3.5)
Lab Sample ID: JB55122-2

Matrix: SO - Soil Date Received: 12/09/13 Method: SW846 8270D SW846 3550C Percent Solids: 79.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Z87304.D 1 12/19/13 EP 12/16/13 OP71437 EZ4368

Run #2

Initial Weight Final Volume

Run #1 32.5 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	190	65	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	770	47	ug/kg	
95-48-7	2-Methylphenol	ND	77	44	ug/kg	
	3&4-Methylphenol	ND	77	49	ug/kg	
100-02-7	4-Nitrophenol	ND	390	65	ug/kg	
108-95-2	Phenol	ND	77	41	ug/kg	
83-32-9	Acenaphthene	ND	39	11	ug/kg	
120-12-7	Anthracene	ND	39	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	39	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	39	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	39	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	39	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	39	15	ug/kg	
92-52-4	1,1'-Biphenyl	ND	77	4.5	ug/kg	
218-01-9	Chrysene	ND	39	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	39	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	77	8.6	ug/kg	
84-66-2	Diethyl phthalate	ND	77	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	48.0	77	34	ug/kg	J
206-44-0	Fluoranthene	ND	39	17	ug/kg	
86-73-7	Fluorene	ND	39	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	39	13	ug/kg	
91-57-6	2-Methylnaphthalene	ND	77	22	ug/kg	
91-20-3	Naphthalene	ND	39	11	ug/kg	
85-01-8	Phenanthrene	ND	39	18	ug/kg	
129-00-0	Pyrene	ND	39	15	ug/kg	
110-86-1	Pyridine	ND	77	15	ug/kg	
91-22-5	Quinoline	ND	190	36	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	

367-12-4 2-Fluorophenol 72% 13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-4C(3.5)

 Lab Sample ID:
 JB55122-2
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 79.6

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	63%		15-110%
118-79-6	2,4,6-Tribromophenol	88%		20-123%
4165-60-0	Nitrobenzene-d5	<b>73</b> %		10-110%
321-60-8	2-Fluorobiphenyl	74%		<b>17-110</b> %
1718-51-0	Terphenyl-d14	82%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH613-4C(3.5)

**Date Sampled: 12/09/13** Lab Sample ID: JB55122-2 Matrix: SO - Soil Date Received: 12/09/13

Method: SW846 8011 SW846 8011 79.6 **Percent Solids:** 

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/12/13 M:OP36167 M:GBB3111 Run #1 a BB53254.D 1 12/13/13 **AMA** 

Run #2

**Final Volume Initial Weight** Run #1 30.2 g 50.0 ml

Run #2

CAS No. Compound Units Result RL**MDL** Q

106-93-4 1,2-Dibromoethane ND 3.1 1.2 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

460-00-4 Bromofluorobenzene (S) 61-167% 121% 460-00-4 Bromofluorobenzene (S) 114% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



# **Report of Analysis**

Client Sample ID: MH613-4C(3.5) **Date Sampled:** 12/09/13 Lab Sample ID: JB55122-2 Date Received: 12/09/13 Matrix: SO - Soil

Percent Solids: 79.6

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.7	6.4	0.085	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	73.4	2.6	0.27	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	22.0	5.1	0.10	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	26.8	6.4	0.093	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	1130	2.6	0.30	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909

(2) Prep QC Batch: MP76729

RL = Reporting Limit MDL = Method Detection Limit

B = Indicates a result > = MDL but < RL



U = Indicates a result < MDL

Page 1 of 1

 Client Sample ID:
 MH613-5C(1.5)

 Lab Sample ID:
 JB55122-3
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8260B
 Percent Solids:
 83.8

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	E210668.D	1	12/13/13	HSS	n/a	n/a	VE9245
Run #2	E210694.D	1	12/13/13	KC	n/a	n/a	VE9247

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.8 g	10.0 ml	100 ul
Run #2	6.8 g	10.0 ml	5.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	97	12	ug/kg	
108-88-3	Toluene	4210	97	14	ug/kg	
100-41-4	Ethylbenzene	15500	97	17	ug/kg	
1330-20-7	Xylene (total)	263000 a	1900	350	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	97	33	ug/kg	
135-98-8	sec-Butylbenzene	ND	490	18	ug/kg	
98-06-6	tert-Butylbenzene	ND	490	16	ug/kg	
110-82-7	Cyclohexane	ND	490	25	ug/kg	
107-06-2	1,2-Dichloroethane	ND	97	31	ug/kg	
110-54-3	Hexane	ND	490	53	ug/kg	
98-82-8	Isopropylbenzene	207	490	14	ug/kg	J
91-20-3	Naphthalene	ND	490	18	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	328	490	16	ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	152	490	22	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	88%	91%	59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	83%	89%	65-1	23%	
2037-26-5	Toluene-D8	96%	97%	80-1	24%	
460-00-4	4-Bromofluorobenzene	88%	95%	71-1	32%	

#### (a) Result is from Run# 2

 $ND = Not detected \qquad MDL =$ 

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 2

Client Sample ID: MH613-5C(1.5)

 Lab Sample ID:
 JB55122-3
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 83.8

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Z87305.D 1 12/19/13 EP 12/16/13 OP71437 EZ4368

Run #2

Initial Weight Final Volume

Run #1 32.1 g 1.0 ml

Run #2

**ABN Special List** 

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	535	190	62	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	740	45	ug/kg	
95-48-7	2-Methylphenol	62.6	74	42	ug/kg	J
	3&4-Methylphenol	73.2	74	47	ug/kg	J
100-02-7	4-Nitrophenol	ND	370	63	ug/kg	
108-95-2	Phenol	ND	74	39	ug/kg	
83-32-9	Acenaphthene	ND	37	11	ug/kg	
120-12-7	Anthracene	ND	37	13	ug/kg	
56-55-3	Benzo(a)anthracene	23.9	37	12	ug/kg	J
50-32-8	Benzo(a)pyrene	19.7	37	11	ug/kg	J
205-99-2	Benzo(b)fluoranthene	28.9	37	12	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	23.7	37	14	ug/kg	J
207-08-9	Benzo(k)fluoranthene	ND	37	14	ug/kg	
92-52-4	1,1'-Biphenyl	ND	74	4.3	ug/kg	
218-01-9	Chrysene	27.3	37	13	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	37	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	74	8.3	ug/kg	
84-66-2	Diethyl phthalate	ND	74	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	74	33	ug/kg	
206-44-0	Fluoranthene	44.1	37	16	ug/kg	
86-73-7	Fluorene	ND	37	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	16.3	37	13	ug/kg	J
91-57-6	2-Methylnaphthalene	ND	74	21	ug/kg	
91-20-3	Naphthalene	ND	37	10	ug/kg	
85-01-8	Phenanthrene	32.2	37	17	ug/kg	J
129-00-0	Pyrene	37.4	37	14	ug/kg	
110-86-1	Pyridine	ND	74	15	ug/kg	
91-22-5	Quinoline	ND	190	35	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	

ND = Not detected

367-12-4

MDL = Method Detection Limit

62%

RL = Reporting Limit

E = Indicates value exceeds calibration range

2-Fluorophenol

J = Indicates an estimated value

13-110%

B = Indicates analyte found in associated method blank



#### Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-5C(1.5) Lab Sample ID: JB55122-3

 Lab Sample ID:
 JB55122-3
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 83.8

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	63%		<b>15-110</b> %
118-79-6	2,4,6-Tribromophenol	95%		20-123%
4165-60-0	Nitrobenzene-d5	<b>75</b> %		10-110%
321-60-8	2-Fluorobiphenyl	81%		<b>17-110</b> %
1718-51-0	Terphenyl-d14	88%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

Page 1 of 1

Client Sample ID: MH613-5C(1.5) Lab Sample ID: JB55122-3

 Lab Sample ID:
 JB55122-3
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids: 83.8

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53255.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.2 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 118%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 102%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Client Sample ID: MH613-5C(1.5)

Lab Sample ID: JB55122-3 Date Sampled: 12/09/13

Matrix: SO - Soil Date Received: 12/09/13

Percent Solids: 83.8

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	8.1	5.6	0.073	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	15.1	2.2	0.24	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.1	4.5	0.088	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	33.0	5.6	0.081	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	51.9	2.2	0.26	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909(2) Prep QC Batch: MP76729

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



J

Page 1 of 1

Page 1 of 1

 Client Sample ID:
 MH613-5C(3.0)

 Lab Sample ID:
 JB55122-4
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8260B
 Percent Solids:
 81.1

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	E210669.D	1	12/13/13	HSS	n/a	n/a	VE9245
Run #2	E210695.D	1	12/13/13	KC	n/a	n/a	VE9247

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.1 g	10.0 ml	100 ul
Run #2	6.1 g	10.0 ml	10.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	110	14	ug/kg	
108-88-3	Toluene	7660	110	16	ug/kg	
100-41-4	Ethylbenzene	8080	110	20	ug/kg	
1330-20-7	Xylene (total)	93300 a	1100	200	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	110	39	ug/kg	
135-98-8	sec-Butylbenzene	ND	560	20	ug/kg	
98-06-6	tert-Butylbenzene	ND	560	18	ug/kg	
110-82-7	Cyclohexane	ND	560	29	ug/kg	
107-06-2	1,2-Dichloroethane	ND	110	36	ug/kg	
110-54-3	Hexane	ND	560	61	ug/kg	
98-82-8	Isopropylbenzene	73.5	560	17	ug/kg ug/kg	J
91-20-3	Naphthalene	ND	560	21	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	123	560	18	ug/kg ug/kg	J
108-67-8	1,3,5-Trimethylbenzene	27.3	560	25	ug/kg ug/kg	J
100 07 0	1,0,0 11imethylbenzene	27.0	000	20	"6 <sup>, 11</sup> 5	•
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	89%	90%	59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	84%	89%	65-1	23%	
2037-26-5	Toluene-D8	96%	99%	80-1	24%	
460-00-4	4-Bromofluorobenzene	88%	92%	71-1	32%	

#### (a) Result is from Run# 2

ND = Not detected MD

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



## **Report of Analysis**

Client Sample ID: MH613-5C(3.0) Lab Sample ID: JB55122-4

 Lab Sample ID:
 JB55122-4
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 81.1

Dueingte Swo40 02/UD Swo40 533UC

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Z87306.D 1 12/19/13 EP 12/16/13 OP71437 EZ4368

Run #2

Initial Weight Final Volume

Run #1 32.6 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	186	190	64	ug/kg	J
51-28-5	2,4-Dinitrophenol	ND	760	46	ug/kg	
95-48-7	2-Methylphenol	ND	76	43	ug/kg	
	3&4-Methylphenol	ND	76	48	ug/kg	
100-02-7	4-Nitrophenol	ND	380	64	ug/kg	
108-95-2	Phenol	ND	76	40	ug/kg	
83-32-9	Acenaphthene	ND	38	11	ug/kg	
120-12-7	Anthracene	33.4	38	13	ug/kg	J
56-55-3	Benzo(a)anthracene	34.9	38	12	ug/kg	J
50-32-8	Benzo(a)pyrene	21.9	38	12	ug/kg	J
205-99-2	Benzo(b)fluoranthene	28.1	38	13	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	22.5	38	14	ug/kg	J
207-08-9	Benzo(k)fluoranthene	ND	38	14	ug/kg	
92-52-4	1,1'-Biphenyl	ND	76	4.4	ug/kg	
218-01-9	Chrysene	30.0	38	13	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	38	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	76	8.4	ug/kg	
84-66-2	Diethyl phthalate	ND	76	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	76	33	ug/kg	
206-44-0	Fluoranthene	106	38	17	ug/kg	
86-73-7	Fluorene	26.1	38	12	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	13	ug/kg	
91-57-6	2-Methylnaphthalene	ND	76	21	ug/kg	
91-20-3	Naphthalene	ND	38	10	ug/kg	
85-01-8	Phenanthrene	121	38	17	ug/kg	
129-00-0	Pyrene	112	38	15	ug/kg	
110-86-1	Pyridine	ND	76	15	ug/kg	
91-22-5	Quinoline	ND	190	36	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	its	

ND = Not detected

367-12-4

MDL = Method Detection Limit

**73**%

RL = Reporting Limit

E = Indicates value exceeds calibration range

2-Fluorophenol

J = Indicates an estimated value

13-110%

B = Indicates analyte found in associated method blank



Page 2 of 2

# **Report of Analysis**

Client Sample ID: MH613-5C(3.0) Lab Sample ID: JB55122-4

 Lab Sample ID:
 JB55122-4
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 81.1

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	65%		<b>15-110</b> %
118-79-6	2,4,6-Tribromophenol	100%		20-123%
4165-60-0	Nitrobenzene-d5	<b>78</b> %		10-110%
321-60-8	2-Fluorobiphenyl	<b>82</b> %		<b>17-110</b> %
1718-51-0	Terphenyl-d14	94%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH613-5C(3.0) Lab Sample ID: JB55122-4

Matrix: SO - Soil

Method: SW846 8011 SW846 8011

Project: Sunoco - Marcus Hook Facility, PA

Date Sampled: 12/09/13 Date Received: 12/09/13

Percent Solids: 81.1

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53256.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.2 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.1 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 118%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 101%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH613-5C(3.0)
Lab Sample ID: JB55122-4
Matrix: SO - Soil

Date Sampled: 12/09/13 Date Received: 12/09/13 Percent Solids: 81.1

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	7.2	6.0	0.079	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	18.8	2.4	0.25	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.4	4.8	0.094	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	31.2	6.0	0.087	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	61.7	2.4	0.28	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909

(2) Prep QC Batch: MP76729

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



Page 1 of 1

Client Sample ID: MH613-1C(1.0)
Lab Sample ID: JB55122-5
Matrix: SO - Soil

Method: SW846 8260B

Project: Sunoco - Marcus Hook Facility, PA

Date Sampled: 12/09/13 Date Received: 12/09/13

Percent Solids: 81.4

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Y141705.D 1 12/15/13 PS n/a n/a VY6136

Run #2

**Initial Weight** 

Run #1 6.3 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q	
71-43-2	Benzene	ND	0.98	0.12	ug/kg		
108-88-3	Toluene	ND	0.98	0.14	ug/kg		
100-41-4	Ethylbenzene	0.35	0.98	0.17	ug/kg	J	
1330-20-7	Xylene (total)	1.1	0.98	0.17	ug/kg		
1634-04-4	Methyl Tert Butyl Ether	ND	0.98	0.33	ug/kg		
135-98-8	sec-Butylbenzene	ND	4.9	0.18	ug/kg		
98-06-6	tert-Butylbenzene	ND	4.9	0.16	ug/kg		
110-82-7	Cyclohexane	ND	4.9	0.25	ug/kg		
107-06-2	1,2-Dichloroethane	ND	0.98	0.31	ug/kg		
110-54-3	Hexane	ND	4.9	0.53	ug/kg		
98-82-8	Isopropylbenzene	ND	4.9	0.14	ug/kg		
91-20-3	Naphthalene	ND	4.9	0.18	ug/kg		
95-63-6	1,2,4-Trimethylbenzene	ND	4.9	0.16	ug/kg		
108-67-8	1,3,5-Trimethylbenzene	ND	4.9	0.22	ug/kg		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its		
1868-53-7	Dibromofluoromethane	96%		59-1	30%		
17060-07-0	1,2-Dichloroethane-D4	<b>85</b> %		65-1	23%		
2037-26-5	Toluene-D8	101%		80-1	24%		
460-00-4	4-Bromofluorobenzene	93%		71-132%			

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



## **Report of Analysis**

Client Sample ID: MH613-1C(1.0) Lab Sample ID: JB55122-5

**Date Sampled: 12/09/13 Matrix:** SO - Soil Date Received: 12/09/13 Method: SW846 8270D SW846 3550C Percent Solids: 81.4

Sunoco - Marcus Hook Facility, PA **Project:** 

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/16/13 OP71437 EZ4368 Run #1 Z87307.D 1 12/19/13 EP

Run #2

**Final Volume Initial Weight** 

Run #1 33.2 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	190	62	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	740	45	ug/kg	
95-48-7	2-Methylphenol	ND	74	42	ug/kg	
	3&4-Methylphenol	ND	74	47	ug/kg	
100-02-7	4-Nitrophenol	ND	370	63	ug/kg	
108-95-2	Phenol	ND	74	39	ug/kg	
83-32-9	Acenaphthene	ND	37	11	ug/kg	
120-12-7	Anthracene	ND	37	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	37	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	37	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	37	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	37	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	37	14	ug/kg	
92-52-4	1,1'-Biphenyl	ND	74	4.3	ug/kg	
218-01-9	Chrysene	ND	37	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	37	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	74	8.2	ug/kg	
84-66-2	Diethyl phthalate	ND	74	13	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	74	33	ug/kg	
206-44-0	Fluoranthene	ND	37	16	ug/kg	
86-73-7	Fluorene	ND	37	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	37	13	ug/kg	
91-57-6	2-Methylnaphthalene	ND	74	21	ug/kg	
91-20-3	Naphthalene	ND	37	10	ug/kg	
85-01-8	Phenanthrene	ND	37	17	ug/kg	
129-00-0	Pyrene	ND	37	14	ug/kg	
110-86-1	Pyridine	ND	74	15	ug/kg	
91-22-5	Quinoline	ND	190	35	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
367-12-4	2-Fluorophenol	73%		13-1	10%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Page 2 of 2

# 4

# **Report of Analysis**

Client Sample ID: MH613-1C(1.0)

 Lab Sample ID:
 JB55122-5
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Mathod:
 SW846 8870D, SW846 2550C
 Page 2550C
 Page 2550C

Method: SW846 8270D SW846 3550C Percent Solids: 81.4

Project: Sunoco - Marcus Hook Facility, PA

#### **ABN Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	<b>70</b> %		15-110%
118-79-6	2,4,6-Tribromophenol	77%		20-123%
4165-60-0	Nitrobenzene-d5	84%		10-110%
321-60-8	2-Fluorobiphenyl	<b>82</b> %		17-110%
1718-51-0	Terphenyl-d14	91%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH613-1C(1.0) Lab Sample ID: JB55122-5

 Lab Sample ID:
 JB55122-5
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids: 81.4

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 a BB53257.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.5 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 120%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 107%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: MH613-1C(1.0) **Date Sampled:** 12/09/13 Lab Sample ID: JB55122-5 Date Received: 12/09/13 SO - Soil Matrix: Percent Solids: 81.4

Project: Sunoco - Marcus Hook Facility, PA

#### **Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	4.3 B	6.4	0.085	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	11.6	2.6	0.27	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.5	5.2	0.10	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	28.9	6.4	0.094	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	44.9	2.6	0.30	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909 (2) Prep QC Batch: MP76729

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



RL = Reporting Limit

Page 1 of 1

 Client Sample ID:
 MH613-1C(3.5)

 Lab Sample ID:
 JB55122-6
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8260B
 Percent Solids: 82.5

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	E210670.D	1	12/13/13	HSS	n/a	n/a	VE9245
Run #2 a	E210693.D	1	12/13/13	KC	n/a	n/a	VE9247

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.8 g	10.0 ml	100 ul
Run #2	6.8 g	10.0 ml	25.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	33.1	100	13	ug/kg	J
108-88-3	Toluene	ND	100	14	ug/kg	
100-41-4	Ethylbenzene	308	100	17	ug/kg	
1330-20-7	Xylene (total)	1420	100	18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	34	ug/kg	
135-98-8	sec-Butylbenzene	1930	500	18	ug/kg	
98-06-6	tert-Butylbenzene	332	500	16	ug/kg	J
110-82-7	Cyclohexane	13500	500	26	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	32	ug/kg	
110-54-3	Hexane	ND	500	54	ug/kg	
98-82-8	Isopropylbenzene	701	500	15	ug/kg	
91-20-3	Naphthalene	ND	500	18	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	500	16	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	500	22	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	<b>87</b> %	90%	59-1	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	88%	92%	65-1	23%	
2037-26-5	Toluene-D8	191% b	122%	80-1	24%	
460-00-4	4-Bromofluorobenzene	114%	95%	71-1	32%	

- (a) Confirmation run for surrogate recoveries.
- (b) Outside control limits due to matrix interference. Confirmed by reanalysis.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



## **Report of Analysis**

Client Sample ID: MH613-1C(3.5)

 Lab Sample ID:
 JB55122-6
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids: 82.5

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Z87308.D 1 12/19/13 EP 12/16/13 OP71437 EZ4368

Run #2

Initial Weight Final Volume

Run #1 33.4 g 1.0 ml

Run #2

#### **ABN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	5-67-9 2,4-Dimethylphenol		180	61	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	730	44	ug/kg	
95-48-7	2-Methylphenol	ND	73	41	ug/kg	
	3&4-Methylphenol	ND	73	46	ug/kg	
100-02-7	4-Nitrophenol	ND	360	61	ug/kg	
108-95-2	Phenol	ND	73	38	ug/kg	
83-32-9	Acenaphthene	ND	36	11	ug/kg	
120-12-7	Anthracene	ND	36	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	36	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	36	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	36	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	36	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	36	14	ug/kg	
92-52-4	1,1'-Biphenyl	ND	73	4.2	ug/kg	
218-01-9	Chrysene	ND	36	12	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	36	12	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	73	8.1	ug/kg	
84-66-2	Diethyl phthalate	ND	73	12	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	73	32	ug/kg	
206-44-0	Fluoranthene	ND	36	16	ug/kg	
86-73-7	Fluorene	ND	36	12	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	36	13	ug/kg	
91-57-6	2-Methylnaphthalene	42.3	73	20	ug/kg	J
91-20-3	Naphthalene	ND	36	9.9	ug/kg	
85-01-8	Phenanthrene	ND	36	17	ug/kg	
129-00-0	Pyrene	ND	36	14	ug/kg	
110-86-1	Pyridine	ND	73	15	ug/kg	
91-22-5	Quinoline	ND	180	34	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2 Limits		its	
007 10 4	9 El	700/		10 1	100/	

367-12-4 2-Fluorophenol 76% 13-110%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

## Page 2 of 2

## **Report of Analysis**

Client Sample ID: MH613-1C(3.5) Lab Sample ID: JB55122-6

 Lab Sample ID:
 JB55122-6
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3550C
 Percent Solids:
 82.5

Project: Sunoco - Marcus Hook Facility, PA

## **ABN Special List**

CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	<b>70</b> %		<b>15-110</b> %
118-79-6	2,4,6-Tribromophenol	94%		20-123%
4165-60-0	Nitrobenzene-d5	<b>80</b> %		10-110%
321-60-8	2-Fluorobiphenyl	<b>79</b> %		<b>17-110</b> %
1718-51-0	Terphenyl-d14	88%		30-124%

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



#### Page 1 of 1

## **Report of Analysis**

Client Sample ID: MH613-1C(3.5) Lab Sample ID: JB55122-6

**Date Sampled: 12/09/13** Matrix: SO - Soil Date Received: 12/09/13 Method: SW846 8011 SW846 8011 Percent Solids: 82.5

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/12/13 M:OP36167 Run #1 a BB53258.D 1 12/13/13 **AMA** M:GBB3111

Run #2

**Final Volume Initial Weight** Run #1 50.0 ml 30.5 g

Run #2

CAS No. Compound Units Result RL**MDL** Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

460-00-4 Bromofluorobenzene (S) 61-167% 142% 460-00-4 Bromofluorobenzene (S) 126% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## Page 1 of 1

## **Report of Analysis**

Client Sample ID: MH613-1C(3.5) Lab Sample ID: JB55122-6 Matrix: SO - Soil

**Metals Analysis** 

**Date Sampled:** 12/09/13 Date Received: 12/09/13 Percent Solids: 82.5

**Project:** Sunoco - Marcus Hook Facility, PA

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	5.2 B	6.0	0.079	mg/kg			12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	8.7	2.4	0.25	mg/kg	1		12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	10.1	4.8	0.094	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	32.0	6.0	0.087	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	36.5	2.4	0.28	mg/kg	1	12/18/13	12/21/13 SM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA32909 (2) Prep QC Batch: MP76729

RL = Reporting Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



MDL = Method Detection Limit

Page 1 of 1

Client Sample ID: MH614-3C(1.5)
Lab Sample ID: JB55122-7
Matrix: SO - Soil

Method: SW846 8260B

Project: Sunoco - Marcus Hook Facility, PA

Date Sampled: 12/09/13 Date Received: 12/09/13

Percent Solids: 83.6

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 Y141612.D 1 12/13/13 PS n/a n/a VY6133

Run #2

**Initial Weight** 

Run #1 6.2 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.96	0.12	ug/kg	
108-88-3	Toluene	ND	0.96	0.14	ug/kg	
100-41-4	Ethylbenzene	0.38	0.96	0.17	ug/kg	J
1330-20-7	Xylene (total)	2.4	0.96	0.17	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.96	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	0.96	0.31	ug/kg	
98-82-8	Isopropylbenzene	0.84	4.8	0.14	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	ND	4.8	0.15	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	4.8	0.21	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	91%		59-1	30%	
17060-07-0	1,2-Dichloroethane-D4	83%		65-1	23%	
2037-26-5	Toluene-D8	100%		80-1	24%	
460-00-4	4-Bromofluorobenzene	100%		71-1	32%	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



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Client Sample ID: MH614-3C(1.5)

 Lab Sample ID:
 JB55122-7
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3546
 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a F70890.D 1 12/20/13 AMA 12/12/13 M:OP36179 M:MSF3164

Run #2

Initial Weight Final Volume

Run #1 20.4 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	120	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	120	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	120	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	120	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg	
218-01-9	Chrysene	ND	120	15	ug/kg	
86-73-7	Fluorene	ND	120	16	ug/kg	
91-20-3	Naphthalene	ND	120	19	ug/kg	
85-01-8	Phenanthrene	ND	120	16	ug/kg	
129-00-0	Pyrene	ND	120	14	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	68%		30-1	30%	
321-60-8	2-Fluorobiphenyl	82%		30-1	30%	
1718-51-0	Terphenyl-d14	83%		30-1	30%	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH614-3C(1.5)

 Lab Sample ID:
 JB55122-7
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids: 83.6

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53259.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.3 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 118%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 101%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



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# 1

## **Report of Analysis**

Client Sample ID: MH614-3C(1.5) Lab Sample ID: JB55122-7

 ole ID:
 JB55122-7
 Date Sampled:
 12/09/13

 SO - Soil
 Date Received:
 12/09/13

 Percent Solids:
 83.6

Project: Sunoco - Marcus Hook Facility, PA

**Metals Analysis** 

Matrix:

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead 31.7 2.4 0.25mg/kg 1 12/18/13 12/21/13 SM SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA32909(2) Prep QC Batch: MP76729

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



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 Client Sample ID:
 MH614-3C(3.4)

 Lab Sample ID:
 JB55122-8
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8260B
 Percent Solids: 83.4

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E210671.D	1	12/13/13	HSS	n/a	n/a	VE9245
Run #2	E210696.D	1	12/13/13	KC	n/a	n/a	VE9247
Run #3	E210791.D	1	12/17/13	KC	n/a	n/a	VE9251

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.6 g	10.0 ml	100 ul
Run #2	6.6 g	10.0 ml	1.0 ul
Run #3	6.6 g	10.0 ml	0.20 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3	Benzene Toluene	30.0 6180	100 100	13 14	ug/kg ug/kg	
100-41-4 1330-20-7	Ethylbenzene Xylene (total)	817000 a 13400000 b	10000 50000	1800 9000	ug/kg ug/kg	
1634-04-4 107-06-2	Methyl Tert Butyl Ether 1,2-Dichloroethane	ND	100 100	35 32	ug/kg	
98-82-8	Isopropylbenzene	ND 12800	500	15	ug/kg ug/kg	
95-63-6 108-67-8	1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	12200 8230	500 500	16 22	ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	<b># 3</b>	Limits
1868-53-7	Dibromofluoromethane	86%	90%	92%		<b>59-130</b> %
17060-07-0 2037-26-5	1,2-Dichloroethane-D4 Toluene-D8	<b>82</b> % <b>96</b> %	90% 98%	92% 96%		65-123% 80-124%
460-00-4	4-Bromofluorobenzene	92%	93%	96%		71-132%

(a) Result is from Run# 2

(b) Result is from Run# 3

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH614-3C(3.4)

 Lab Sample ID:
 JB55122-8
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3546
 Percent Solids:
 83.4

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a F70891.D 1 12/20/13 AMA 12/12/13 M:OP36179 M:MSF3164

Run #2

Initial Weight Final Volume

Run #1 20.1 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	120	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	120	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	120	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	120	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg	
218-01-9	Chrysene	ND	120	15	ug/kg	
86-73-7	Fluorene	22.2	120	16	ug/kg	J
91-20-3	Naphthalene	279	120	19	ug/kg	
85-01-8	Phenanthrene	ND	120	16	ug/kg	
129-00-0	Pyrene	15.9	120	14	ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	65%		30-1	30%	
321-60-8	2-Fluorobiphenyl	81%		30-1	30%	
1718-51-0	Terphenyl-d14	84%		30-1	30%	
	· .					

<sup>(</sup>a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH614-3C(3.4) Lab Sample ID: JB55122-8

**Date Sampled: 12/09/13** Matrix: SO - Soil Date Received: 12/09/13

Method: SW846 8011 SW846 8011 **Percent Solids:** 83.4

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/12/13 M:OP36167 Run #1 a BB53261.D 1 12/13/13 **AMA** M:GBB3111

Run #2

**Final Volume Initial Weight** Run #1 50.0 ml 30.6 g

Run #2

CAS No. Compound Units Result RL**MDL** Q

106-93-4 1,2-Dibromoethane ND 2.9 1.1 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

460-00-4 Bromofluorobenzene (S) 61-167% 121% 460-00-4 Bromofluorobenzene (S) 104% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



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## **Report of Analysis**

Client Sample ID: MH614-3C(3.4)

Lab Sample ID: JB55122-8 Date Sampled: 12/09/13 Matrix: SO - Soil Date Received: 12/09/13

Percent Solids: 83.4

Project: Sunoco - Marcus Hook Facility, PA

**Metals Analysis** 

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead 30.1 2.5 0.26mg/kg 1 12/18/13 12/21/13 SM SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA32909(2) Prep QC Batch: MP76729

RL = Reporting Limit MDL = Method Detection Limit U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



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 Client Sample ID:
 MH615-3C(1.0)

 Lab Sample ID:
 JB55122-9
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8260B
 Percent Solids:
 79.7

Project: Sunoco - Marcus Hook Facility, PA

		File ID	DF	Analyzed	By	Prep Date	<b>Prep Batch</b>	<b>Analytical Batch</b>
F	Run #1	Y141613.D	1	12/13/13	PS	n/a	n/a	VY6133
F	Run #2	E210763.D	1	12/16/13	KC	n/a	n/a	VE9249

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.6 g		
Run #2	6.3 g	10.0 ml	100 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No. Compound Result RL MDL Unit	ts Q
71-43-2 Benzene 15400 a 110 14 ug/k	g
108-88-3 Toluene 150 0.95 0.13 ug/k	
100-41-4 Ethylbenzene 9.3 0.95 0.17 ug/k	
1330-20-7 Xylene (total) 4210 a 110 20 ug/k	
1634-04-4 Methyl Tert Butyl Ether ND 0.95 0.33 ug/k	
107-06-2 1,2-Dichloroethane ND 0.95 0.31 ug/k	
98-82-8 Isopropylbenzene 0.93 4.8 0.14 ug/k	_
95-63-6 1,2,4-Trimethylbenzene 93.2 4.8 0.15 ug/k	
108-67-8 1,3,5-Trimethylbenzene 51.6 4.8 0.21 ug/k	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits	
1868-53-7 Dibromofluoromethane 92% 90% 59-130%	
17060-07-0 1,2-Dichloroethane-D4 87% 91% 65-123%	
2037-26-5 Toluene-D8 95% 95% 80-124%	
460-00-4 4-Bromofluorobenzene 92% 93% 71-132%	

#### (a) Result is from Run# 2

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

**Date Sampled: 12/09/13** 

Client Sample ID: MH615-3C(1.0) Lab Sample ID: JB55122-9

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3546
 Percent Solids:
 79.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a F70892.D 1 12/20/13 AMA 12/12/13 M:OP36179 M:MSF3164

Run #2

Initial Weight Final Volume

Run #1 20.3 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	120	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	120	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	120	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	120	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg	
218-01-9	Chrysene	ND	120	15	ug/kg	
86-73-7	Fluorene	ND	120	16	ug/kg	
91-20-3	Naphthalene	ND	120	20	ug/kg	
85-01-8	Phenanthrene	ND	120	17	ug/kg	
129-00-0	Pyrene	ND	120	15	ug/kg	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Lim	its	
4165-60-0	Nitrobenzene-d5	71%		30-1	30%	
321-60-8	2-Fluorobiphenyl	88%		30-1	30%	
1718-51-0	Terphenyl-d14	89%		30-1	30%	

<sup>(</sup>a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

Client Sample ID: MH615-3C(1.0) Lab Sample ID: JB55122-9

 Lab Sample ID:
 JB55122-9
 Date Sampled: 12/09/13

 Matrix:
 SO - Soil
 Date Received: 12/09/13

 Method:
 SW846 8011
 SW846 8011
 Percent Solids: 79.7

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a BB53262.D 1 12/13/13 AMA 12/12/13 M:OP36167 M:GBB3111

Run #2

Initial Weight Final Volume Run #1 30.4 g 50.0 ml

Run #2

CAS No. Compound Result RL MDL Units Q

106-93-4 1,2-Dibromoethane ND 3.1 1.1 ug/kg

CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits

 460-00-4
 Bromofluorobenzene (S)
 117%
 61-167%

 460-00-4
 Bromofluorobenzene (S)
 99%
 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Client Sample ID: MH615-3C(1.0)

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## **Report of Analysis**

Lab Sample ID: JB55122-9 **Date Sampled: 12/09/13** SO - Soil Date Received: 12/09/13 Matrix:

Percent Solids: 79.7 Sunoco - Marcus Hook Facility, PA **Project:** 

**Metals Analysis** 

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead 30.1 2.5 mg/kg 1 12/18/13 12/21/13 SM SW846 6010C <sup>1</sup> 0.27

(1) Instrument QC Batch: MA32909 (2) Prep QC Batch: MP76729

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL



RL = Reporting Limit

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 Client Sample ID:
 MH615-3C(3.5)

 Lab Sample ID:
 JB55122-10
 Date Sampled:
 12/09/13

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8260B
 Percent Solids:
 82.9

Project: Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E210692.D	1	12/13/13	KC	n/a	n/a	VE9247
Run #2	E210792.D	1	12/17/13	KC	n/a	n/a	VE9251

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.3 g	10.0 ml	100 ul
Run #2	6.3 g	10.0 ml	10.0 ul

#### **Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	43800 a	1100	130	ug/kg	
108-88-3	Toluene	480	110	15	ug/kg	
100-41-4	Ethylbenzene	911	110	19	ug/kg	
1330-20-7	Xylene (total)	456	110	19	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	110	36	ug/kg	
107-06-2	1,2-Dichloroethane	ND	110	34	ug/kg	
98-82-8	Isopropylbenzene	422	530	16	ug/kg	J
95-63-6	1,2,4-Trimethylbenzene	ND	530	17	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	530	23	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	its	
1868-53-7	Dibromofluoromethane	91%	92%	59-1	<b>30</b> %	
17060-07-0	1,2-Dichloroethane-D4	91%	93%	65-1	23%	
2037-26-5	Toluene-D8	139%	99%	80-1	24%	
460-00-4	4-Bromofluorobenzene	110%	93%	71-1	<b>32</b> %	

#### (a) Result is from Run# 2

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 



Page 1 of 1

**Date Sampled: 12/09/13** 

Client Sample ID: MH615-3C(3.5)
Lab Sample ID: JB55122-10
Matrix: SO - Soil

 Matrix:
 SO - Soil
 Date Received:
 12/09/13

 Method:
 SW846 8270D
 SW846 3546
 Percent Solids:
 82.9

Project: Sunoco - Marcus Hook Facility, PA

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch Run #1 a F70893.D 1 12/20/13 AMA 12/12/13 M:OP36179 M:MSF3164

Run #2

Initial Weight Final Volume

Run #1 20.4 g 1.0 ml

Run #2

#### **BN Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q	
120-12-7	Anthracene	ND	120	14	ug/kg		
56-55-3	Benzo(a)anthracene	ND	120	15	ug/kg		
50-32-8	Benzo(a)pyrene	ND	120	13	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	120	15	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	120	12	ug/kg		
218-01-9	Chrysene	30.1	120	15	ug/kg	J	
86-73-7	Fluorene	ND	120	16	ug/kg		
91-20-3	Naphthalene	ND	120	19	ug/kg		
85-01-8	Phenanthrene	76.5	120	16	ug/kg	J	
129-00-0	Pyrene	37.2	120	14	ug/kg	J	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its		
4165-60-0	Nitrobenzene-d5	69%		30-1	30%		
321-60-8	2-Fluorobiphenyl	81%	30-130%				
1718-51-0	Terphenyl-d14	84%		30-1	30%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

**E** = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

Client Sample ID: MH615-3C(3.5) Lab Sample ID: JB55122-10

**Date Sampled: 12/09/13** Matrix: SO - Soil Date Received: 12/09/13 Method: SW846 8011 SW846 8011 **Percent Solids:** 82.9

**Project:** Sunoco - Marcus Hook Facility, PA

File ID DF **Analytical Batch** Analyzed By **Prep Date Prep Batch** 12/12/13 Run #1 a BB53263.D 1 12/13/13 **AMA** M:OP36167 M:GBB3111

Run #2

**Final Volume Initial Weight** Run #1 50.0 ml 30.3 g

Run #2

CAS No. Compound Units Result RL**MDL** Q

106-93-4 1,2-Dibromoethane ND 3.0 1.1 ug/kg

CAS No. **Surrogate Recoveries** Run#1 Run# 2 Limits

460-00-4 61-167% **Bromofluorobenzene (S)** 117% 460-00-4 Bromofluorobenzene (S) 95% 61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Page 1 of 1

## **Report of Analysis**

Client Sample ID: MH615-3C(3.5)
Lab Sample ID: JB55122-10
Matrix: SO - Soil

Date Sampled: 12/09/13 Date Received: 12/09/13 Percent Solids: 82.9

Project: Sunoco - Marcus Hook Facility, PA

**Metals Analysis** 

Analyte Result RL**MDL** Units DF Prep Analyzed By Method **Prep Method** SW846 3050B <sup>2</sup> Lead 12.5 2.4 0.25mg/kg 1 12/18/13 12/21/13 SM SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA32909(2) Prep QC Batch: MP76729

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL

RL = Reporting Limit MDL = Method Detection Limit



Misc. Forms

**Custody Documents and Other Forms** 

## Includes the following where applicable:

- Chain of Custody
- Chain of Custody (Accutest Labs of New England, Inc.)



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-		LAB	OF	AT	OR	IES

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ACCUTEST:	フレー	Ì							FED-EX Tracking #								Bottle Order Control #								
LABORATORIES			2235 F TEL. 732-32	Route 130,	Dayton,	NJ 08	810	180					ŀ	Accutest	Quote #					Accutest J	ob#	-1	BS	7/10	25
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Client / Reporting Information			Project I	nformat	ion										Reque	sted	Analy	sis (s	ee TE	51 00	UE Sh	eet)		000000000000000000000000000000000000000	IVIALITY COORS
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WEST CHESTER PA 1/380 oject Contact M E-mail	Project#			Street Ad	dress									161								-			AIR - Air
TENGES	213402	353.204		City				Stat	te			Zip		30											SOL - Other Solid WP - Wipe
none # Fax #	Client Purchase C	Order#		City										>						- 1					FB-Field Blank EB-Equipment Blank
ampler(s) Name(s) Phone #	Project Manager			Attention										ند											RB- Rinse Blank TB-Trip Blank
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codest			Time	Sampled by	Matrix	# of bo	ottles 🗜	NaOH	HN03	HZSO	DI Wa	MEOH	ENCOR	\$											LAB USE ONLY
Field ID / Point of Collection	MEOH/DI Vial #	Date		"	50	5	-+-	+	H	+	22	1-1	$\top$	X											MZY
MH615-10 (0.0-2.0)		12.5.13	1415	+	1	1	+	+	H	$^{\dagger}$	11	1	$\top$	X											1402
2 MH615-10 (2.0-4.0)			1420	-	$\vdash\vdash$	+	-	+	+	+	Ш	Ш	$\vdash$	X											4066
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C MH615-40(0.0-10)			1440	-	$\vdash$	+	+	+	++	+	Н	Н	$\vdash$	X		_			-						
6 MH615-4C (20-4.0)			1450	-	$\vdash$	++	+	+	+	+	Н	$^{\rm H}$	$\vdash$	×	-				<del>                                     </del>	-					
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1 Day EMERGENCY	Commercial TB = Results + OC Summary NJ Reduced = Results + OC Summary + Partial Raw ds Sample Custody must be documented below each time samples change possession, including							lata																	
Emergency & Rush T/A data available VIA Lablink		Sample Custody	must be docu	mented	below ea	ich tin	ne sar	mples	s cha	nge	poss	essi	on, inc	luding	courier	delive	ry.			Basch	red By:		<del>,                                     </del>		
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12.5	.13/ 1600						-	Relina	uished	i By:							Date 1				red By:				
Relinquished by Sampler: Date Time:		Received By:					- 1	4									İ			4					

Intact
Not intact

Preserved where app

Custody Seal #

JB54835: Chain of Custody Page 1 of 9

Sib C-19





# ACCUTEST

## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: JB	54835		Client:	t: Project:								
Date / Time Received: 12	/5/2013			Delivery N	/lethod:		Airbill #'s:					
Cooler Temps (Initial/Adjus	sted): <u>#1</u>	: (3.6/3.6	<u>6); 0</u>									
Custody Seals Present:		] 3.	COC Pre	esent: /Time OK	Y or N  ✓ □	Sample labo     Container la     Sample con	grity - Documentation els present on bottles: abeling complete: ntainer label / COC agree: grity - Condition	<u>Y</u>	or N			
2. Cooler temp verification: 3. Cooler media: 4. No. Coolers:		R Gun æ (Bag)				1. Sample rec	ovd within HT: ers accounted for:	<b>✓</b>	□ □ Intact			
Quality Control Preservation	_	or N	N/A			Sample Inte	grity - Instructions	<u>Y</u>	or N	N/A		
<ol> <li>Trip Blank present / cooler:</li> <li>Trip Blank listed on COC:</li> </ol>		<b>✓</b>				1 '	equested is clear: eived for unspecified tests	<b>✓</b>	□			
Samples preserved properly     VOCs headspace free:	/: <b>_</b>		<b>✓</b>			4. Compositir	volume recvd for analysis: ng instructions clear: structions clear:			<b>&gt;</b>		
Comments												
Accutest Laboratories V:732.329.0200					223	5 US Highway 130 F: 732.329.3499				Dayton, New Jersey www/accutest.com		

JB54835: Chain of Custody Page 2 of 9



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ACC	UTEST

ACCUTEST	<b>5</b> 16	C	HAI	IN C	)F (	USI	UD	Y								PA	GE _	0	)F
LABORATORIE	•		2235	Route 13	0, Daytor	a, NJ 0881	0				FED-E	X Tracking #		Bottle Order Control #					
		•	TEL. 732-3	329-0200		32-329-349					Accun	est Quote #			Accu	Acculest Job # JB55122			
Client / Reporting Information			Project			om						Regu	ested Ana	hysis / se	TEST	CODE «		100	Matrix Codes
Company Name	Project Name:					351570000000000						7.040		1 1	10,		1001)		Matrix Codes
STANTEC	Su	NUCO - MAR	cus f	400k							28	34)	İ						DW - Drinking Wat GW - Ground Water
Street Address	Street			100000000000000000000000000000000000000							- L	8	l	1 1			.		WW - Water SW - Surface Water
1060 ANDREW DR. SUITE NO. State Zip	City		State	Billing Compan	Information	on ( if differ	ent from	Repo	rt to)		-\5	ABSITO	1		ı			ļ	SO - Soil SL- Sludge
WEST CHESTER PA 1939	80										3240	48			Į		1		SED-Sediment
Project Contact E-m JENNIFER MENGES				Street A	dress						- 'B'	10,14	İ						OI - Oil LIQ - Other Liquid
Phone # Fax	213407 # Client Purchase Or	.353.204 der#		City			State			Zip	- 3	1 2		1 1		1 1	ĺ		AIR - Air SOL - Other Solid
				'							VECHERS,	VSOIEDB, PB, V, ZA							WP - Wipe FB-Field Blank
Sampler(s) Name(s) Pho	ne# Project Manager			Attention	C						15	1.5 .1		i i					EB-Equipment Blar RB- Rinse Blank
J. CORBETT J. RICHTER		Col	flection				Nun	her of	preserved	Bottlee	1/2	4 5	- 1					1	TB-Trip Blank
Accutest		1			İ			1.	1 6		~3Z8A	3260 SL							
Sample # Field ID / Point of Collection	MEOH/DI Val #	Date	Time	Sampled by	Matrix	# of bottles	NaOH	HZSO	NONE DI Wat	MEOH	3	>							LAB USE ONLY
1 MHG13-40(1.0)		12.9.13 1	305	JR	50	5			2 2	(		X							M28
2 MH613-4c(3.5)		12.9.13 1	307	Sc	50	6			32	1		X							1491
3 MH613-50(1.5)			315	5a	50	6			3 2	,		X							4077
4 MH613-50(3,0)	171/555/1840	12.9.13	317	Jc	50	6		Τ	3 2	1		X							
5 MH613-1C(1.0)	16267784	129.13 13	330	Jc.	50	6		Τ	3 Z	1		X							SUB
6 MH613 - 1 C (3.5)	16 415 18 16	12.9.13	335	JIL	50	6			32	ť		×							1
7 MH614-3c(1.5)	487 By Pak	12.9.13	340	Jc	50	6	TT		3 2	1	×				1				
8 MH614-3c(3.4)	1845 1375 2576	12.9.13	345	JR	50	6		Т	32	1	X								
9 MH615-3c(1.0)	40,55 Just	12.9.13 13	35 <i>5</i>	Jc	50	6		T	32		X				1	1	$\neg \uparrow$		<del> </del>
10 MH615-3c(3.5)	101 0 1		100	JR	50	6		T	32		×				$\top$	+	$\neg$	_	
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¥								1							_	$\top$	$\neg$		
Turnaround Time ( Business days)							Deliverabl							C	mments	/ Special	Instructio	ns	1
Std. 10 Business Days	Approved By (Accutee	t PM): / Date:				al "A" (Len al "B" (Len				ASP Cate									
5 Day RUSH						Level 3+4)			☐ St	ate Forms		F							
3 Day EMERGENCY 2 Day EMERGENCY		*****			IJ Reduce						n EQU	15							
1 Day EMERGENCY				ш,	Commerci	al "C" Commercia	i "A" = Res			her			н	ec'd at	Exto	n Serv	ice Ce	enter	
other Emergency & Rush T/A data available VIA Lablink						Commercia	l "B" = Res	ults +	QC Sur										
Emergency & Rosh I/A data avaisable VIA Labink	Sam	ole Custody must b	oe docum	ented be	low each	NJ Reduce	d = Result	nge	DOSSet	ry # Parti sion," inc	el Raw da	ourier de	livery						
Relinquished by Sampler: Date 1	Ima: 2.9.13/500 Ru	ceived By:	111	7		- 1	Relinquishe		1				Date Tin	•:	Receiv	red By:	-		
-		icelved By:	*				2 Relinquishe	d Bv:		V			Date Tie	13 152		ved By:			
Relinquished by: Date T	9/13 1105 3	icelved By:			<u>حــ</u>	- 1	4	-					55,5	<u>.</u>	4	4.			
5	5	oerred By.			^		Custody Se	al #			Intact Not intac	⇔ Pn t	served where	applicable	- 6	la la la la la la la la la la la la la l	On leaf	Cooler	Tomp.
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JB54835: Chain of Custody Page 3 of 9







## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: JB	55122		Client:	t: Project:									
Date / Time Received: 12	/9/2013			Delivery Meth	Delivery Method: Airbill #'s:								
Cooler Temps (Initial/Adjus	sted): #	1: (1.1/1.1	); 0										
	Y or N		COC Pre		or N	Sample Integrity - Documentation	<u>Y</u>	or N					
,		_		esent:		Sample labels present on bottles:     Container labeling complete:	<b>✓</b>						
Cooler Temperature	<u>Y</u>	or N				Sample container label / COC agree:	<b>✓</b>						
Temp criteria achieved:     Cooler temp verification:     Cooler media:     No. Coolers:		IR Gun ce (Bag)				Sample Integrity - Condition  1. Sample recvd within HT:  2. All containers accounted for:  3. Condition of sample:	<u>Y</u>	or N					
Quality Control Preservation	<u> Y</u>	or N	N/A			Sample Integrity - Instructions	Υ	or N	 N/A				
<ol> <li>Trip Blank present / cooler:</li> <li>Trip Blank listed on COC:</li> </ol>		<b>✓</b>				Analysis requested is clear:     Bottles received for unspecified tests	<b>✓</b>	□					
<ul><li>3. Samples preserved properly</li><li>4. VOCs headspace free:</li></ul>	/: <b>\</b>		<b>✓</b>			Sufficient volume recvd for analysis:     Compositing instructions clear:     Filtering instructions clear:			V				
Comments					2005 110	<u>.</u>							
Accutest Laboratories V:732.329.0200					2235 US F: 732.	Highway 130 329.3499			Dayton, New Jersey www/accutest.com				

JB54835: Chain of Custody Page 4 of 9



Job Change Order:

JB55122

Received Date:

12/10/2013

Requested Date: Account Name:

12/9/2013 12/23/2013

Due Date:

Deliverable:

Sunoco - Marcus Hook Facility, PA Stantec Consulting Services Inc.

Project Description:

kristinb

REDT2 14

TAT (Days):

Please move samples to JB54835. Note that samples were subbed to ALNE also.

Sample #: JB55122-ALL

Dept:

Above Changes Per:

JB54835: Chain of Custody

Page 5 of 9

Client / Jennifer Menges

**Date:** 12/10/2013

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1

JB54991

Received Date: Deliverable: TAT (Days): Due Date: Sunoco - Marcus Hook Facility, PA Stantec Consulting Services Inc. 12/10/2013 kristinb Project Description: Requested Date: Account Name:

12/20/2013 12/6/2013

REDT2 14

Sample #: JB54991-ALL

Dept:

Please move samples to JB54835. Note that samples were subbed to ALNE also.

Above Changes Per:

JB54835: Chain of Custody

Page 6 of 9

Client / Jennifer Menges

**Date:** 12/10/2013

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1

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## CHAIN OF CUSTODY

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ACCUTEST:			2235	Route 130	Dayton	NJ 08810	)					ſ	FED-EX	Tracking	st				Bottle On	rder Control #			
EMBUAN. DALLE			TEL. 732-32	29-0200		2-329-349		)					Accutest	Quote #				7	Accutest	Job#	T	B 54	1991
Client / Reporting Information			Project											Req	uested	Analy	sis (	see TE	STC	ODE she			Matrix Codes
Company Name	Project Name:	1		1,										7									DW - Drinking Water
Street Address	Suns	xo- Mac	ecus /	box				on and the second	PARALLES AND AND AND AND AND AND AND AND AND AND				175	405									GW - Ground Water WW - Water
Street Address	Street					n ( if diffe	cont fr	om Pai	ort to	) 1	000000000	CONTRACT	047	AB82705L									SW - Surface Water SO - Soil
1060 ANDREW DR SUITE 140 City State West CHESTER, 191 1935	City		State	Company		ii ( ii diiie		0111 110	701110	·			88	₹									SL- Sludge SED-Sediment
WEST CHESTER, M. 17335	Project#			Street Ac	idress								m'	V8011EDB),									OI - Oil LIQ - Other Liquid
Project Contact  TENNIFER MENGES  Fax #	Z.13407	1353		0.00071									(D) 108	37	.								AIR - Air SOL - Other Solid
Phone # Fax #	Client Purchase 0	Order#		City				State			Zip		8	8 3		1							WP - Wipe FB-Field Blank
Secontaria Name(s) Phone #	Project Manager			Attention									-	2.0	1								EB-Equipment Blank RB- Rinse Blank
Sampler(s) Name(s) Phone #	Froject manager												2051	55L2, \	1								TB-Trip Blank
J. Corbell			Collection				H	Numbe	r of pres	served	Bottles W		I U W	37									
Accutest	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCI	NaOH HNO3	H2SO4	DI Wate	MEOH		V326	66									LAB USE ONLY
Sample # Field ID / Point of Collection	MEORIOI VIII #	17.5.13	1000	To	50	5	H	+	_	2	,	+	X						-		$\top$	1	1725
MHG14-2C (0.0-2.0)		12.5,13	1005	Jc	50	5	H	+	+	2	1		X										1406
2 MH614-20 (2.0-4.0)		12.5.13	1010	50	50	5	H	+	-	2	1		-	X									4075
3 MH613-2C (0.0-2.0)			<del></del>	50	50	5	+	+	-+-	2 2	+	+		X		-					_	$\top$	1
4 MH613-20 (2.0-4.0)	-	12.5.13	1015	+	<u> </u>	5	+	+	-	22	+	+	-	1							_		SUB
5 MH613-30 (0.0-2.0)		12.5.13	1020	3C	30	-	$\vdash$	+	-	2	1	+	-	×	-						$\dashv$	-	100
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Std. 10 Business Days	***************************************			-		ial "B" ( L ( Level 3+		!)	F		ASP of		ory B		-								
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1 Day EMERGENCY other						Commerc	cial "B	'= Res	ılts + C	C Sur													.,
Emergency & Rush T/A data available VIA Lablink		ample Custody m			alow on	NJ Redu	ced =	Results	+ QC	Summ	ary + F	artial	Raw da	ta	deliver	~							
Relinquished by Sampler: Date Time:	1,00	Received By:		nemed t	retow ea	on unite 5		quished		//	1			- Jul 101	20,,,,,	Date Tir 12 (	ner il	500	Receive	ed By:			
12.6	1.13/120	1	17 V		n.		2		- 6	4	1					Date Tir	43		2 Receive	1/1			
Relinquished by Sampler:	3 1930	Received By:	$\rightarrow \langle$				4	quished				_							4				
Relinquished by: Date Time:		Received By:	-		,		Cust	ody Sea	1#				Intact Not inta	ect	Preserv	ed where	applica	able			On Ice		ler Temp.
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JB54835: Chain of Custody Page 7 of 9



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JB54835: Chain of Custody Page 8 of 9







## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: JB54	1991		Client:			Project:			
Date / Time Received: 12/6	/2013			Delivery M	ethod:	Airbill #'s:			
Cooler Temps (Initial/Adjust	ed): #	1: (1.5/1.	<u>5); 0</u>						
	or N		. COC Pre	ocent:	Y or N ✓	Sample Integrity - Documentation	<u>Y</u>	or N	
<ol> <li>Custody Seals Present: ✓</li> <li>Custody Seals Intact: ✓</li> </ol>		_		/Time OK		Sample labels present on bottles:     Container labeling complete:	<b>✓</b>		
Cooler Temperature	Υ	or N				3. Sample container label / COC agree:	V		
Temp criteria achieved:     Cooler temp verification:     Cooler media:     No. Coolers:		IR Gun ce (Bag)				Sample Integrity - Condition  1. Sample recvd within HT:  2. All containers accounted for:  3. Condition of sample:	<u>Y</u> ✓	or N  Intact	
Quality Control Preservatio	<u>Y</u>	or N	N/A			Sample Integrity - Instructions	<u>Y</u>	or N	N/A
<ol> <li>Trip Blank present / cooler:</li> <li>Trip Blank listed on COC:</li> </ol>		<b>✓</b>				Analysis requested is clear:     Bottles received for unspecified tests	<b>✓</b>	□	
<ul><li>3. Samples preserved properly:</li><li>4. VOCs headspace free:</li></ul>			<b>✓</b>			Sufficient volume recvd for analysis:     Compositing instructions clear:			y V
Comments						5. Filtering instructions clear:			E.
Accutest Laboratories V:732.329.0200						JS Highway 130 732.329.3499			Dayton, New Jersey www/accutest.com

JB54835: Chain of Custody Page 9 of 9



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## CHAIN OF CUSTODY

9000	ACCUTES"	T.		CALARI		_		-																1/-
4888	LABORATORI	E 9												FED-EX	Tracking t	¢				Bottle C	order Contro	ol#		1
				72235 TEL. 732-32	9-0200				,					Accutest	Quote #					Accutes	t Job ≢	JB	54835	
	Client / Reporting Information	T		Project	Informa	tion								T	Reg	uested	Analy	sis ( se	e TES	COD	E sheet	t)		Matrix Codes
Compa	ny Name:	Project Name:												[				]			'	1 1		
Acc	utest Laboratories			Sunoco - Ma	rcus Ho	ok Facil	ity, PA							1										DW - Drinking Water GW - Ground Water
Street A	ddress	Street												1		1								WW - Water SW - Surface Water
223	5 Route 130						on ( if diffe	rent fro	om R	eport to	)					1						1 1		SO - Soil
City		Zip City		State	Compan	y Name								١.							'		. 1	SL- Sludge SED-Sediment
Day					Street A	33								2							'		. ]	OI - Oil LiQ - Other Liquid
	Contact E-mail	Project #			OUEST A	uuress								1	1						'		1	AIR - Air
Phone i		Fax # Client Purchase	Order#		City			S	tate			Zip		V8011							1		į	SOL - Other Solid WP - Wipe
	- -329-0200	Silant Falsing																					- 1	FB-Field Blank
	(s) Name(s)	Phone Project Manage	r		Attention	Y:								1 E						l				EB-Equipment Blank RB- Rinse Blank
JC		į.														1		ŀ		1				TB-Trip Blank
				Collection	1			-	Numb	per of pre	serves			18			1			1				<b> </b>
Accutest			1		Sampled			_	FINOS	HZSO4	Di Wate	меон	ENCORE	B8270SL	1	1			1				-	1
Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	by	Matrix	# of bottles	보 2	Ē	모	ā	× 1	Ď.	Į	<u> </u>	ļ	<del> </del>	<u> </u>	ļ	<del> </del>	$\perp$			LAB USE ONLY
1	MH615-1C(0.0-2.0)		12/5/13	2:15:00 PM	1C	so	2	Ш	L	1	2	Ш	$\perp$	Х		ļ	<u> </u>		_	_	igsquare	$\sqcup$		M24, SUB
2	MH615-1C(2.0-4.0)		12/5/13	2:20:00 PM	1C	so	2	Ш	L	11:	2	Ц	$\perp$	X			<u> </u>		<u> </u>	<u> </u>	igsquare			M24, SUB
3	MH615-2C(0.0-2.0)		12/5/13	2:30:00 PM	)C	so	2	Ш	┸	Ш	+-	Ш		X	<u> </u>	<u> </u>	<del> </del>		<del>  </del>	<u> </u>	$\perp \perp \mid$	$\vdash$		M24, SUB
4	MH615-2C(2.0-4.0)		12/5/13	2:35:00 PM	1C	so	2	Ц	$\perp$	11:	+	Ш	$\perp$	X		<u> </u>		_	<del> </del>	<b>↓</b>	$\perp$	$\vdash \vdash$		M24, SUB
5	MH615-4C(0.0-2.0)		12/5/13	2:40:00 PM	)C	so	2	Щ	$\downarrow$	1	-	Н	$\bot$	X		<u> </u>	<u> </u>	<u> </u>	<del>                                     </del>	↓	$\vdash$	$\vdash \vdash$		M24, SUB
6	MH615-4C(2.0-4.0)		12/5/13	2:50:00 PM	)C	so	2	Ш	$\perp$	1	+	Н	1	X		<u> </u>	↓	_	-	↓	$\vdash$	$\vdash$		M24, SUB
7	MH614-1C(0.0-2.0)		12/5/13	2:55:00 PM	JC	so	2	Ц.	1		+-	$\sqcup$	$\perp$	X		↓		-	ļ	-	┼	$\vdash$		M24, SUB
8	MH614-1C(2.0-4.0) 2		12/5/13	3:00:00 PM	JC	so	2	H	$\downarrow$		-	$\vdash$	+	X		ļ	├	-	-	-	$\vdash$	$\vdash$		M24, SUB
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								Ш	1	$\bot\bot$	1	$\sqcup$				—	┼	ऻ—	-	┼	$\vdash$	<del></del>	-+	100
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	Turnaround Time ( Business days)						ial "A" (Li			infom		YASP	Catego	onr A		Cond	200ml	or B82					011EDB	
١.		Approved By (Acc	utest PM): / Date:				naiA (Li :ia!"B" (Li			늗		YASP	_			Jenu	SUUTITI	UI BOZ	700011	ici, aci	a com	101 702	TILDE	
:	Std. 10 Business Days 5 Day RUSH						Level 3+4			Ē	_	tate Fo				l								
	3 Day EMERGENCY					NJ Reduc	ed			Ē		DD Fo												
	2 Day EMERGENCY					Commerc	ial "C"			D	[] o	ther <u>F</u>	REDT	2		-								
	1 Day EMERGENCY						Commerci																	
	X other Due 12/19/2013						Commerci NJ Reduc							Raw da	ta									
Eme	rgency & Rush T/A data available VIA Lablink		Sample Custo	dy must be do	cument	ed belov	v each tin	ne san	nple	s char	ge p	osses	ssion,	, includ	ing cou	rier de	livery.							
		Date Tin 19:00	Received By:					Reling				K	0				Date Tin	50	(2)	Receive	d By:	2	:L	,
		12-6-13 Date Time:	1 FED	=X				2 Relings	ulshed	d Bv:	/						Date Tin			Receive	d By:		-7/	
Relino 3	uished by Sampler:	name vilue:	3					4 Cumtod					-	Intact		Procesu	ed where	mnlicabk		4		Onice	Coo	ler Temp.

JB54835: Chain of Custody Page 1 of 6 Accutest Labs of New England, Inc.



### CHAIN OF CUSTODY

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400		• • •													feen en	Tracking									
	LABORATOR	188						, NJ 088							1	-					Bottle	Order Con	etroi #		(
					TEL. 732-3		FAX: 7. accutest.c		99/34	80					Accutes	Quote #					Accute	st Job #	JE	354991	<u> </u>
	Client / Reporting Information				Project			Oitt				-			<del> </del>	Ren	uestor	Analy	cie / e	oo TES	ST COD	E char			Matrix Codes
Compa	ny Name:	P	Project Name:												<b>†</b>	T	I	T	1	T	T	/L Silet	1	ТТ	Wallix Codes
Ac	cutest Laboratories	- 1			Sunoco - Ma	rcus Ho	ok Facil	ity, PA									1	1	1	1		1			DW - Drinking Wate
Street		St	treet												1			1	1			1	1		GW - Ground Water WW - Water
	5 Route 130							on ( if diffe	rent	from F	Repor	t to)					1	1							SW - Surface Water SO - Soil
City	State rton NJ 08810	Zip C	City		State	Compar	ny Name								1	l									SL- Sludge
L	rton NJ 08810 Contact E-mail		Project #			Street A	ddraee								4	1	1		1	1					SED-Sediment OI - Oil
krist			roject#			) See Co. A	dujess															1			LIQ - Other Liquid AIR - Air
Phone		Fax# C	lient Purchase	Order #		City		······································		State			Zip		┨					1				1	SOL - Other Solid
732	-329-0200	- 1													80	8	1								WP - Wipe FB-Field Blank
	r(s) Name(s)	Phone Pi	roject Manage	at .		Attention	1:								V8011EDB	直		İ	1				1	1 1	EB-Equipment Blank RB- Rinse Blank
JC						<u> </u>		,							5	,V8011EDB	l		l			1			TB-Trip Stank
		l			Collection	1	-		⊢	Numi	berof	preserv	ed Bott	les Ш	ğ					1					
Acoutest Sample #	Field ID / Point of Collection	١.	MEOH/D) Vial #			Sampled	l		Ξ	HNO3	HZSO4	NONE	MEOH	COR	AB8270SL	B8270SL		1	1						1
			MECHADI VISIL#	Date	Time	by	Matrix	# of bottles	Ĭ	ŽŤ	꾸	-	2 2	ú	4	ļ		-		╀	-	-	_		LAB USE ONLY
1	MH614-2C(0.0-2.0)			12/5/13	10:00:00 AM		so	2*	Н	+	Н	2	$\perp$	$\vdash$		X		ļ		ـــ		-			SUB, M25*
2	MH614-2C(2.0-4.0)	_		12/5/13	10:05:00 AM		so	2*	Н	+	Н	2	1	Ц.		Х		↓		<u> </u>					SUB, M25*
3	MH613-2C(0.0-2.0)			12/5/13	10:10:00 AM		so	2*	Ц	_	$\sqcup$	2	$\perp$	$\perp$	Х						<u> </u>				SUB, M25*
4	MH613-2C(2,0-4.0)			12/5/13	10:15:00 AM	JC	so	2*	Ц	_	Ш	2	Ш		Х					<u> </u>					SUB, M25*
5	MH613-3C(0.0-2.0)			12/5/13	10:20:00 AM	JC	so	2*	Ц		Ш	2	Ш		Х										SUB, M25*
6	MH613-3C(2.0-4.0)			12/5/13	10:25:00 AM	JC	so	2*			Ш	2	Ш	丄	Х									- 1	SUB, M25*
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	Turnaround Time ( Business days)							Data I												Con	ments /	Special	Instructi	ons	
١,	Std. 10 Business Days	Арр	proved By (Accur	itest PM): / Date:		_		al "A" (Le al "B" ( Le			-			Catego		- 1									ach sample
	5 Day RUSH							Levei3+4		,	L		tate F		пуш						IS to be V8011		ALNJ	IOL MF ! YI	S analysis. Send
	3 Day EMERGENCY					·	U Reduce		•		ř			ormat		[									
i	2 Day EMERGENCY					$\equiv$	Commerci	al "C"			Ē	<u>x</u> 0	ther_	REDT	2										
1	1 Day EMERGENCY							Commerci	"A" la	= Res	ults O	nly													ĺ
	other Due 12/20/2013 gency & Rush T/A data available ViA Lablink							Commercii NJ Reducii								- 1									
Ente	gency & Rosh I/A data available V/A Labink			Sample Custos	dy must be doo	umente											er deli	verv.			T				
ن د		Date Tin	7:00	Received By:			•			uished		F	7					Date Time	9:	30	Received	By:	~		<i>}</i>
	erranoo	12-9	-13	* -	>EX				2			1	<i>t</i>				-	12/10/	3		2	~	-0	17	
Refinq 3	uished by Sampler:	Date Time:		Received By: 3				- 1	4	uished	-							Date Time			Received 4	By:			
Reling 5	uished by:	Date Time;		Received By:					Justoc	ly Seal	* 9	0	5		ntact	F	reserved	where ap	plicable				On ke	2 or Cook	er Temp.

JB54835: Chain of Custody Page 2 of 6



### CHAIN OF CUSTODY

<b>ACCUTEST</b>
LABORATORIES

400	LABORATOR	ILES		2235	Route 13	O Danston	, NJ 0881	n						FED-EX	Tracking 1	1				Bottle C	order Con	tirol#			<del></del>
				TEL. 732-3	29-0200		32-329-34		30					Acculest	Quote #					Accides	t Job #	J	B5512	22	
	Client / Reporting Information			Project	Informa	ation									Req	ested	Analys	is ( se	e TES	TCOD	E she	et)			Matrix Codes
1	ny Name:	Project Name:																		1					
1	utest Laboratories			Sunoco - Ma	rcus Ho	ok Facil	ity, PA										1	l			1	1			DW - Drinking Wate GW - Ground Water
Street /		Street			-				-							l	1								WW - Water SW - Surface Water
City	5 Route 130	Zip City		State	Billing		on ( if diffe	rent f	rom R	Report to	)					l				1	1				SO - Soil
Day		Zip City		State	Compar	ly Ivalile																			SL- Sludge SED-Sediment OI - Oil
1	Contact E-mail	Project#			Street A	ddress								œ,	-				Ì	İ	1				LIQ - Other Liquid
Phone		Fax# Client Purchas	0.1-4		City				State			Zip	_		80										AIR - Air SOL - Other Solid
	-329-0200	Client Purchas	2 Cross #		City			•	OLDIG			2.0		5	11E				1		1				WP - Wipe FB-Field Blank
	(s) Name(s)	Phone Project Manage	er		Attention	1:							$\dashv$	V8011ED	,V8011EDB						1		1 1		EB-Equipment Blank RB- Rinse Blank
JR															2							1			TB-Trip Blank
				Collection			1	L	Numl	ber of pre	served		$\Box$	20	OSI										
Accutest Sample #	Field ID / Point of Collection	MEOH/DI Viai#	Date	Time	Sampled by	Matrix	# of bottles	豆	NaOH HNO3	H2SO4	Di Water	MEOH		AB8270SL	B8270SL										LAB USE ONLY
1	MH613-4C(1.0) L		12/9/13	1:05:00 PM	JR	so	2*			2	2			Х											M28, SUB
2	MH613-4C(1.0) ~		12/9/13	1:07:00 PM	JR	so	2*			2	L		$\Box$	Х											M28, SUB
3	MH613-4C(1.0) 2		12/9/13	1:15:00 PM	JR	so	2*	Ш		2		$\perp$	Ш	Х											M28, SUB
4	MH613-4C(1.0) ~		12/9/13	1:17:00 PM	JR	so	2*	Ш	$\perp$	2			Ц	Х											M28, SUB
5	MH613-4C(1.0) -		12/9/13	1:30:00 PM	JR	so	2*	Ц	$\perp$	2	Ц		Ц	Х							_				M28, SUB
6	MH613-4C(1.0) -		12/9/13	1:35:00 PM	JR	so	2*	Ш		2			Ц	Х											M28, SUB
7	MH613-4C(1.0) 2-		12/9/13	1:40:00 PM	JR	so	2*	Ш	_	2	Ш	$\perp$	Ш		Х										M28, SUB
8	MH613-4C(1.0) ~		12/9/13	1:45:00 PM	JR	so	2*	Ш	$\perp$	2	П		Ш		Х					ļ		<u> </u>	$\sqcup$		M28, SUB
9	MH613-4C(1.0) >>		12/9/13	1:55:00 PM	JR	so	2*	4	┸	2	1-1	4	Н	_	X										M28, SUB
10	MH613-4C(1.0) =		12/9/13	2:00:00 PM	JR	so	2*	Ш	1	2	Ш	4	$\sqcup$		X								$\sqcup$		M28, SUB
								Ц	$\perp$	Н-	Н	_	Н	_						<u> </u>			$\sqcup$	_	
			<u> </u>					Ш		LL.	Ш		Ш												
	Turneround Time ( Business days)									Inform										ments /					
١,	Std. 10 Business Days	Approved By (Acc	utest PM): / Date:				al "A" (Le al "B" (Le			<u> </u>	-	ASP C				"ALIQU 300mi	JOT NE	EDED	<ul> <li>Piea</li> <li>10a fre</li> </ul>	se send	i for ea	ach san	nple (1)	60ml	bottle and (1) ng to keep in
•	S Day RUSH				-		Level 3+4				-	te For	-	, -		ALNJ f	or MET	ALS ar	nalysis	. Location	ons an	e noted	on CO	C.	ng to Roop at
	3 Day EMERGENCY					ij Reduci	ed				ED	D For	nat _		_			_							
	2 Day EMERGENCY					Commerci					-	ner <u>RE</u>	DT2				- 10	JF							
	1 Day EMERGENCY						Commerci								- 1		70	,							i
	other <u>Due 12/23/2013</u> gency & Rush T/A data available ViA Lablini	k		I			Commercia NJ Reduce						ertial R	aw data											
			Sample Custor	ly must be doo	umente	d below					e po	ssess	ion, i	ncludir	ıg cour										
	uished by Sampler:	Date Tin 17:00	Received By:	×				Relinqı 2	uished	By: 7	-5	D	K.				Date Time	1-13	750	Received 2	5	a	- 3	m	
	Jished by Sampler:	Date Time:	Received By:			***************************************	i		uished								Date Time			Received		-			
Reting 5	ashed by:	Date Time:	Received By:					Custod	ty Seal	91	1			lact ot intact	1	reserved	where sp	plicable				On ice.	-3	Cooler	emb.
<u> </u>		L	14								<u> </u>			e energ											

JB54835: Chain of Custody Page 3 of 6



Job Change Order:

JB54991

Received Date:

12/20/2013 12/6/2013

Due Date:

REDT2

4

Deliverable:

Sunoco - Marcus Hook Facility, PA

Project Description:

kristinb

CSR:

Stantec Consulting Services Inc.

12/10/2013

Requested Date: Account Name: TAT (Days):

Sample #: JB54991-ALL

Dept:

Please move samples to JB54835. Note that samples were subbed to ALNE also.

Above Changes Per:

Client / Jennifer Menges

Date: 12/10/2013

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1

JB54835: Chain of Custody Page 4 of 6 JB55122

12/23/2013 12/9/2013 Received Date: Deliverable: Due Date:

TAT (Days):

REDT2

Sunoco - Marcus Hook Facility, PA

Project Description:

kristinb

CSR:

Stantec Consulting Services Inc.

12/10/2013

Requested Date: Account Name: 4

Please move samples to JB54835. Note that samples were subbed to ALNE also.

Sample #: JB55122-ALL

Dept:

Client / Jennifer Menges

Above Changes Per:

JB54835: Chain of Custody

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Date: 12/10/2013

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

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# CT

## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: JB548	335	Client: AC	CNJ		Immediate Client	Services Actio	n Require	ed: No
Date / Time Received: 12/9/2	2013		Delivery M	ethod:	Client Service	Action Requir	ed at Log	in: No
Project: SUB			No. Cooler	s:	2 Airbill #'s:			
Sooler Security Y	or N			or N	Sample Integrity - Documentation	<u>Y</u>	or N	
Custody Seals Present:		3. COC Prese			Sample labels present on bottles:	<b>✓</b>		
2. Custody Seals Intact: ✓		4. Smpl Dates/Ti	ime OK 🔽		2. Container labeling complete:	<b>v</b>		
ooler Temperature	Y or	N_			3. Sample container label / COC agree:	$\checkmark$		
Temp criteria achieved:	$\checkmark$				Sample Integrity - Condition	<u>Y</u>	or N	-
Cooler temp verification:	Infared				1. Sample recvd within HT:	V		
3. Cooler media:	Ice (ba	ag)			2. All containers accounted for:	<b>~</b>		
uality Control Preservation	Y or	N N/A			3. Condition of sample:		Intact	
1. Trip Blank present / cooler:					Sample Integrity - Instructions	<u>Y</u>	or N	N/A
2. Trip Blank listed on COC:					Analysis requested is clear:	<b>✓</b>		
3. Samples preserved properly:	✓				2. Bottles received for unspecified tests		<b>✓</b>	
4. VOCs headspace free:					3. Sufficient volume recvd for analysis:	V		
					4. Compositing instructions clear:			<b>✓</b>
					5. Filtering instructions clear:			<b>✓</b>
Comments								
Accutest Laboratories			495 <sup>-</sup>		center West, Bidg One			Marlborough, M

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